Pit and Quarry
SAND · GRAVEL · STONE
HANDLING · CRUSHING · SCREENING · WASHING

Big Blast Hole Drilling in Cement Quarries

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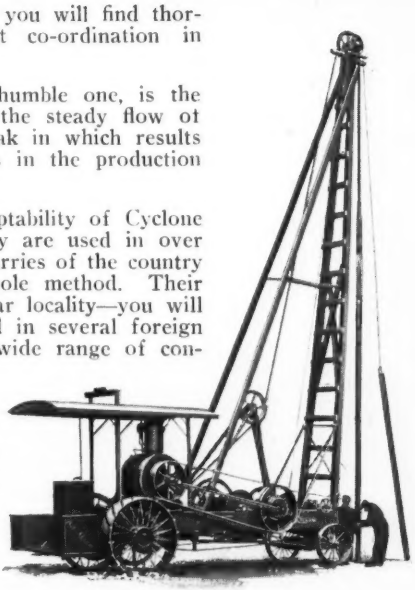
The blast hole drill, though a humble one, is the first rock moving unit. It starts the steady flow of stone from quarry to plant, a break in which results in expensive and hazardous delays in the production schedule.

Proof of the reliability and adaptability of Cyclone Big Blast Hole Drills is that they are used in over 50 per cent of the cement plant quarries of the country now operating by the big blast hole method. Their use is not confined to one particular locality—you will find them from coast to coast and in several foreign countries, and operating under a wide range of conditions.



"Big Blast Hole Drills" is a combination text book and catalog on drilling for open cut rock excavation. It contains considerable data of a semi-technical nature on the subject, and also fully covers Cyclone Big Blast Hole Drills. Write for a copy.

THE SANDERSON-CYCLONE DRILL CO.
ORRVILLE, OHIO

Eastern and Export Office:
30 Church Street, New York

December, 1921

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Circulation, 6,800 copies net

Why this company uses Brownhoists

"We were so pleased with the results from our first crane that a year later we purchased another Brownhoist of the same capacity," says the president of the Lenox Sand and Gravel Company, New York City.

The Lenox Company are wholesale and retail dealers in sand, gravel and broken stone. Their two Brownhoists handle 300,000 tons of the above materials per year at a cost of a little over 4 cents a ton. Besides an enormous saving in handling charges, the crane makes possible twelve deliveries per day per truck instead of five. And they enable this company to give faster delivery service to their customers.

A sturdy, economical Brownhoist should save you money on your handling work. These cranes are built in many types and sizes. Write for a copy of our Catalog K if you are interested in cutting your material handling costs.

The Brown Hoisting Machinery Co. Cleveland, Ohio

Branch Offices:

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DEDICATED TO QUALITY SINCE 1880

Pit and Quarry

Member Audit Bureau of Circulations
A Monthly Journal for Producers of Sand, Gravel, Stone, Cement, Gypsum and Lime

VOL. 6 CHICAGO, ILL. DECEMBER, 1921 NO. 3

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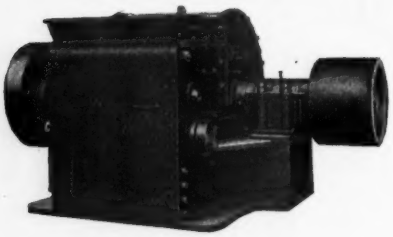


This Dixie Mogul Crusher is installed in the Pyramid Portland Cement Co.'s plant

PYRAMID PORTLAND CEMENT COMPANY
DES MOINES, IOWA

November 12, 1921.

Dixie Machinery Mfg. Company,
3665-3667 Market Street,
St. Louis, Missouri.

Gentlemen:-

Replying to your letter of November 1st regarding the Dixie Mogul Crusher we purchased from you for our rock crushing plant, would say that the reason we bought your crusher is that after careful investigation we found that this crusher is built about 30% stronger than any other make of swing hammer type mill. It is also so designed to make the operating cost of repairs much less than the older types.

This latter feature has been possible by your later design in general and is a reason for our purchasing your crusher

After having used other makes of hinged hammer crushers we consider yours the best crusher of this type on the market today and we are well satisfied with the machine.

Yours very truly,

PYRAMID PORTLAND CEMENT COMPANY

E Struckmann

General Manager.

ES-M

Cement plants need the best crushers and pulverizers to insure continuous and economic operation.

This letter tells a whole story in itself and shows why you should purchase Dixie Mogul Crushers and Pulverizers.

It costs you not one cent to investigate, but it costs you money to try crushers that are too weak to do your work.

Our 30 years' experience will prove an asset to you.

Send us your crusher and pulverizer problems, we will work them out.

DIXIE MACHINERY MANUFACTURING COMPANY
3661 Market Street
Saint Louis - - - Missouri

Pit and Quarry

Vol. 6 Chicago, Ill., December, 1921 No. 3

Operator: "We can't load you with those top boards on. These other fellows are hauling most of my stuff now."

What the Farmer Gets

THE so-called "agricultural bloc" at Washington, whether it deserves the credit or not, will no doubt feel chesty over the recent rate cut of 10 per cent granted by the railroads on agricultural products for a six-month period. In return the "bloc" is apparently expected to exert itself to bring about a reduction of wages of railroad employes, if it wants the lower rates to continue in force.

We submit, however, that the farmer, whether he knows it or not, is not as vitally interested in the freight rates on wheat and alfalfa as he is in the rates on road-making materials.

The cost of transportation from the farm to the nearest freight station is of much more concern to him than the railroad haul thereafter, for it comes as a direct charge against the proceeds from his crop, and it varies according to the condition of the roads over which he travels.

The farmer's products are of a high tonnage value compared to sand, gravel and stone, and this 10 per cent will make little difference to anybody. These things are necessities and the people must have them at any price.

On the other hand, road-building materials are not essential to the preservation of life, so they can be dispensed with when the price be-

comes too high. The farmer may thus be cheated out of a road which would cut appreciably the cost of getting his crops to market; but apparently he is so altruistic as to prefer the saving in transportation charge to accrue to the other fellow rather than to himself. The railroads also are not running true to form, in that they are lowering the rate on goods which must move at any price, and are holding to prohibitive rates on an immense potential tonnage which can move only under favorable conditions.

The prize in view seems to be the farmer's help to get lower wage scales.

But we can see how the farmer might serve his own interests much better in another way—by helping to get rates which will promote road construction.

Wisconsin

WISCONSIN looms large in this issue. The matter of its proposed safety code for quarries, as given herein, would ordinarily be a fairly big story; but it is overshadowed this time by the article giving the result of our investigations in the state on the experiences of road contractors with private, temporary pits for supplies of materials.

The matter given in detail in the latter article is local in its source only. The subject is one which is of vital importance in every locality where the question of local supplies is likely to arise. The established commercial producer is a bigger, more important man in Wisconsin today because this experiment has been tried. Next year he will in all probability get most of the business without question. But we hope it will not be necessary for all states to go through the experiment. Let them read this article and learn their lesson from Wisconsin.

Open-Price Sustained

THE recent decision of Judge Carpenter in Chicago, upholding the open-price association as in no way conflicting with the Sherman anti-trust act, is not only in line with good business, but is as well a relief to hundreds of our readers who are members of such associations and who, until the question was raised, had no thought that they might be doing anything contrary to law. Judge Carpenter says they were not—so we hope that is settled. His decision is rather lengthy and is in some respects almost a complete treatise on modern business principles. The Judge could apparently have made as great a success in the commercial world as he has in his profession.

Up to the I. C. C.

FAILING to get the necessary rate relief from other quarters, the National Association of Sand and Gravel Producers is to be congratulated on having lived up to its "platform" by bringing a formal complaint before the Interstate Commerce Commission. How gratifying it would be if something definite could be reported on this at the January convention. But such speed on the part of the Commission would be almost too much to hope for.

Why Not?

HENRY FORD has taken note of the high cost of railroad transportation and wants to help out by putting a line of "water flivvers" on some of our inland waterways.

Well, why not let him? He'd get a lot of business.

Cement Industry in the British Isles

Written especially for PIT and QUARRY
BY ALFRED B. SEARLES
Technical Advisor to the Cement and Allied Industries

THE manufacture of Portland cement has made great strides during the past ten years; and in spite of the general depression in trade and the disturbances caused by the War, the number of new works steadily increases, whilst the number of old-fashioned and obsolete works which are gradually being closed down shows that, under present-day conditions, the trade all goes to the firms which can deliver the cement at the lowest rate.

This state of affairs is a direct result of the general use of the Standard Specification, for while most users do not attempt to test the cement they can purchase they do expect it to pass the Standard Specification, and orders usually stipulate this. The result is that most of the smaller manufacturers who are unable to maintain an efficient staff of chemists have gradually had to close down or to amalgamate with larger firms.

With about four exceptions, all the cement manufacturing firms in the British Isles are members of the two great combines—the Associated Portland Cement Manufacturers Ltd., and the British Cement Manufacturers Ltd.—with their various subsidiary companies and associations. Manufacturers who are not members of these associations miss the advantages of a widespread and powerful selling organization, but claim that the freedom they possess more than counterbalances this and often enables them to effect sales which they would otherwise miss. There is, in fact, a great difference of opinion as to the value of membership in one or other of the associations, and feeling sometimes rises high when manufacturers meet in hotels and elsewhere, though generally the greatest friendliness prevails.

The publicity so necessary in the selling of cement and in educating the public to its possibilities, is partly effected by the different firms individually and partly by combined effort through such bodies as the Concrete Utilities' Bureau, and the Cement Marketing book "Every-day Uses of Cement," published by the former, is known throughout the British Empire and is probably the best attempt which has yet been made to convey in a single volume the information required by the ordinary user of Portland cement.

Newspaper propaganda was not popular among cement manufacturers until recently, but a widespread campaign costing about a million dollars has been launched and the general public now learns from its newspapers that concrete is the best and cheapest building material. This has aroused the British Manufacturers Association, which is now considering what counter-effect can be secured.

With all this propaganda and what appears to be the extraordinarily powerful position of the Cement Makers' Alliance, it might be expected that the manufacture of Portland cement in the British Isles would be an exceedingly prosperous and profitable industry. As a matter of fact, it is neither, and only the wisest statesmanship and the application of the most businesslike qualities can greatly improve the position. The reasons are numerous and so closely associated with the earlier histories of the firms forming

the present combines that they cannot be given fully here. It must suffice to say that there is now a greater amount of unanimity than ever and when those in control have sufficient courage to tackle their problems in a wise businesslike manner disregarding all protests to the contrary the industry can be made one of the most satisfactory and profitable in Europe. In the present writer's opinion, there is a lack of the right kind of courage and farsightedness, which substitutes amateur instead of expert financial and technical control over the general policy of the cement manufacturers in the British Isles. That this opinion is not held by those in control is, perhaps, only natural, but a thorough and courageous investigation will show that it is substantially correct. The effect of a state of fear and inability to formulate a sound policy for the future is clearly shown in a reply recently sent by the secretary of the Associated Portland Cement Manufacturers Ltd. to an inquiry as to the present condition and future outlook of the trade. This reply is in the following terms:

"Like most of the other industries in the country, the Portland cement industry is much affected by the abnormal conditions now prevailing. These conditions change so frequently that it is impossible to speak with any accuracy as to the present business situation, and still more impossible is it to hazard a forecast for the coming year. I am sorry that I cannot reply in any other manner."

Other replies from various men in high positions in the cement industry are in similar terms.

Is it surprising that dividends are small and sales limited, when such an attitude is maintained at the headquarters of what is reputed to be a powerful combine? Yet, with courage and skill in the formation and application of a sound policy, the British Portland cement industry can reach a success far beyond its previous attainments.

For many years, the technical side of the industry has been too much under the control of men who were content to accept foreign machines and methods as superior to all others, and even now the relative merits of shaft kilns and rotary kilns are sadly misunderstood. At the same time, in contrast to the German cement works, there is a marked absence of any chemists of world-wide reputation as specialists in cement, retained by the British cement firms to act solely in their interests. Even the research work which is being carried on is quite of a desultory nature, the great fundamental problems which underlie the future technical success of the industry being apparently overlooked for the most part, and where they are considered they appear to be largely misunderstood.

On the financial side, there has all along been a lack of ability, which has only been tolerated on account of the great personal respect felt for those chiefly concerned.

Yet so remarkable is the innate skill of the average Britisher that the normal product of the cement works of the British Isles will compare favourably in strength and quality with Portland cement made in any other part of the world. Innumerable tests and long experience has shown the great reliability of British Portland cement, and the remarkably few failures—even including all those in remote parts of the world where engineers skilled in the use of Portland cement are not available—are an outstanding testimony to the practical superiority of the British product.

The prices charged for British Portland cement have necessarily been so high as to be almost prohibitive, and the high freights on railway and on the sea has prevented many sales. The

scarcity of coal and ships, both during the War and since, has had a very serious effect on the industry, but supplies of coal are now much easier and cheaper, more ships are available, and the cost of freight is falling, so that in these respects the future looks brighter than the past. The drop of more than two dollars a ton in the price charged for cement should assist the sales, but if wages could be lowered and the cost of coal and freight still further reduced, the sales would probably increase fairly rapidly.

There is need for enormous quantities of British Portland cement, both at home and in many parts of the world, but there is little demand at present prices, and consequently the industry is in a very depressed state. With a bold and far-sighted policy—leaving the consideration of immediate dividends aside until the present crisis is passed—the industry can certainly regain more than all it has lost, but it can never do so as long as a pessimistic, weak and over-cautious policy is pursued.

The competition created by the so-called "natural cements" and "hydraulic limes" is felt chiefly in localities where the value of Portland cement is not appreciated. Engineers, architects and builders who know the value of Portland cement conforming to the British Standard Specification do not readily accept any substitutes, with the result that the latter can only be supplied to ignorant or careless buyers and to those users who can make use of a less regular and feebler binding agent. The fact that such large quantities of natural cement and hydraulic lime are still sold for building purposes shows that there is great need for the continuance of active propaganda by the manufacturers of Portland cement and that there is a large market ready as soon as such propaganda has done its work.

The wisest among the manufacturers of Portland cement have realized that one of the essentials to success is the replacement of human labour by mechanical devices as far as ever possible. At the same time, such manufacturers must be satisfied as to the saving to be effected by such replacement before they will invest in automatic conveyors, self-loaders, sack- or barrel-fillers and the many other devices offered to them. British manufacturers are rather more cautious than American ones in their acceptance of new machinery and in the obsolescence of existing plant, but when once they have been convinced of the value of any new or improved machine they will make the best possible use for it. The great increase in the use of American machinery in the cement and allied industries is a clear proof that ingenious devices meet with a ready sale whenever their effective values are understood.

The future of the cement trade in British Isles is undoubtedly bright, provided the industry is properly managed on the lines already indicated. If, on the contrary, a weak and short-sighted policy is adopted or an insufficiently progressive attitude is continued, those men—prominent in the industry—who regard its future pessimistically will probably have their fears confirmed.

The Portland cement industry of the British Isles has had a remarkable past, and with sage control, the exercise of a far-sighted and sound judgment and the necessary use of the greatest financial and technical skill which are available to it, though not confined to its present directors, its future may be all that could be desired. Before the golden fruits of complete success can be reached, there will have to be much pruning of the old trees, the removal of much useless wood and the careful nourishing of the younger plants.

Progress on New Western States Cement Plant

CONSTRUCTION work on the new cement mill of the Western States Portland Cement Company at Davenport, Iowa, has arrived at a point where it is possible to give an idea of the form the works will assume when completed. Building activities under the direction of Mr. A. D. Stancliff are going along steadily and a number of departments are already completed.

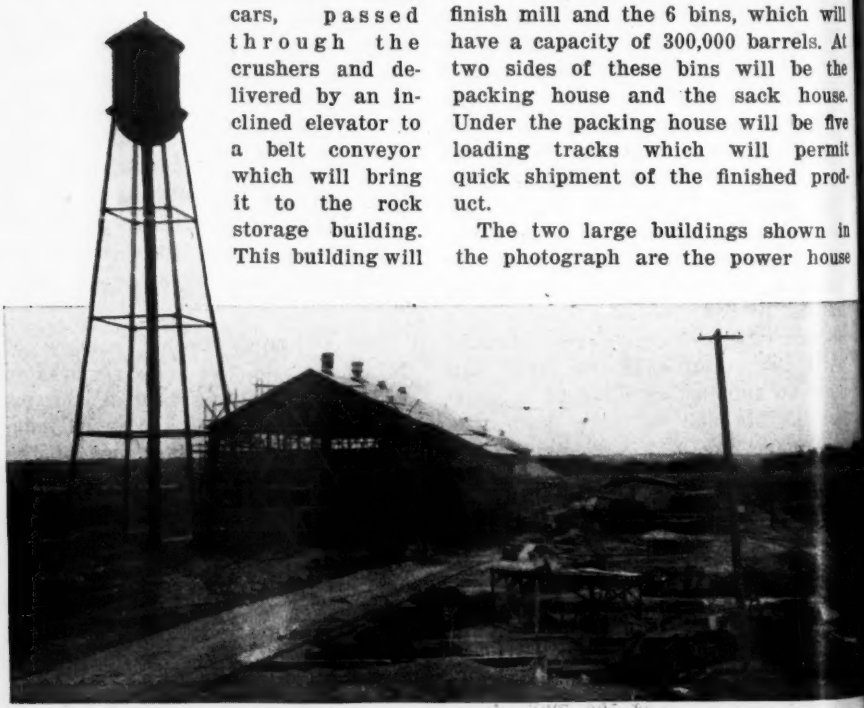
Limestone, shale, and clay are all on the property, making their transportation to the plant a simple and economical matter. The limestone deposit is reached from the crusher by an inclined track with a 5 per cent grade. Material will be taken up this track in dump cars, passed through the crushers and delivered by an inclined elevator to a belt conveyor which will bring it to the rock storage building. This building will be 400 feet long and 80 feet wide.

Clay will be taken in trains from the deposit close by and dumped in the clay storage building, which will be 160 feet long and 80 feet wide.

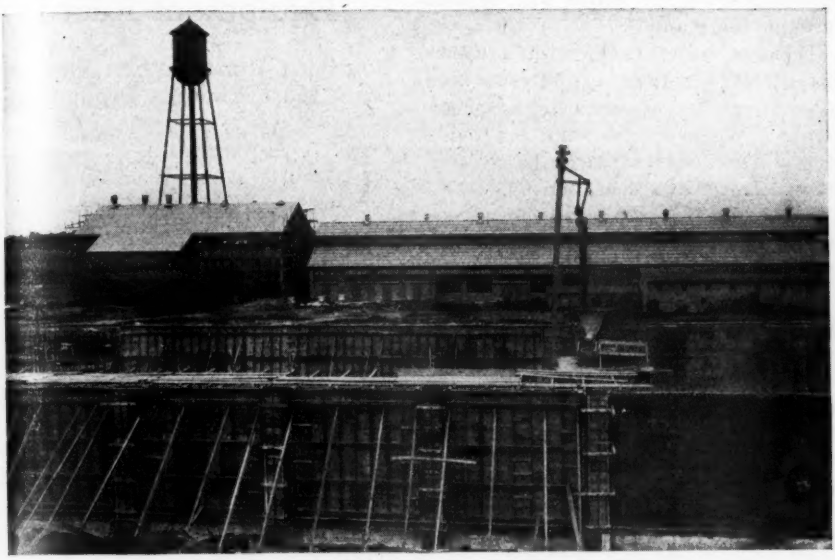
To the side of these two buildings will be the clay wash mill and slurry storage. In line with this will be the large building in which the mill operations proper will be carried on. This building will be 1100 feet long and about 80 feet wide. In it will be located the raw mill, the kilns, the firing floor and the finish mill. At two sides of the finish mill will be the coal storage building and the coal mill. The clinker storage will be located at the side of the kilns.

A conveyor will run between the finish mill and the 6 bins, which will have a capacity of 300,000 barrels. At two sides of these bins will be the packing house and the sack house. Under the packing house will be five loading tracks which will permit quick shipment of the finished product.

The two large buildings shown in the photograph are the power house



General View of Construction of



Buildings Nearing Completion

and the building in which are the store room and machine shop. The store room is 96 feet long and 60 feet wide, the machine shop 80 feet long and 160 feet wide. Space has been left for a future extension of the power house, should the latter become necessary. A spur track from the interurban railway line running to Davenport has been built into the store room and makes a convenient handling of supplies possible. The machine shop is at present equipped with lathes, punch presses, and the other machines necessary for the construction of much of the material used in the building of the mill.

At the entrance to the plant there will be an office building, a restaurant and change room, and a garage. At the back will be a locomotive house with five tracks to accommodate the

s Cement Plant at Davenport, Iowa

company's engines which will be used around the plant.

A large water tank, with a capacity of 75,000 gallons, has already been erected, as will be seen in the photograph. Wells will be sunk for drinking water and there will be a large reservoir for the operations.

The company will have sidings on both the electric interurban railway and the D. R. I. and M.

In the crusher building will be a 36x60 inch crusher which will be fed by side dumping cars.

A traveling crane will deliver the material from the clay storage to the raw mill in a clamshell bucket. The same method will be used between the raw mill and the kilns.

Kilns will be 220 feet long and 10 feet in diameter and will have a daily capacity of 1,000 barrels each. There will be five kilns, giving the plant an output of 5,000 barrels per day. Stacks will be 200 feet in height.

Three 1,000 H.P. Diesel engines have already been erected in the power house. They were furnished by the McIntosh & Seymour Company. Each of these operates a General Electric A. C. generator. Above and to the side of the generators is the large switchboard gallery. The power building is 112 feet long and 60 feet wide.

At the time the photograph was taken decision had not been made as to whether pulverized coal or crude oil would be used. In the event of the use of pulverized coal, the coal mill will be located at one side of the finish mill and coal will be brought to it from the coal storage by a belt conveyor.

At that time, too, decision had not yet been reached on the mill machinery that would be installed.

The Orton & Steinbrenner Co., of Chicago, manufacturers of locomotive cranes, clam shell and orange peel buckets, have made arrangements with the F. C. Richmond Machinery Co., 117 West Second St., Salt Lake City, Utah, to represent them.

Equipment Added

Southern Illinois Plant Developing More Efficient Production

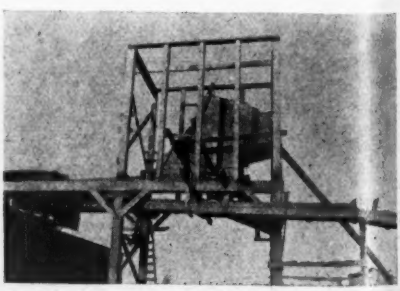
THE Southern Illinois Sand and Gravel Company has recently made a number of additions to its plant at Metropolis, Ill., and reports very satisfactory operation. The plant, owned by Mr. W. F. Barnard, is located about two miles out of Metropolis, an Illinois town on the Ohio River.

The deposit runs over the greater part of 40 acres to an average depth of 45 feet. A high percentage of gravel is present, covered by a sandy overburden of 4 to 5 feet.

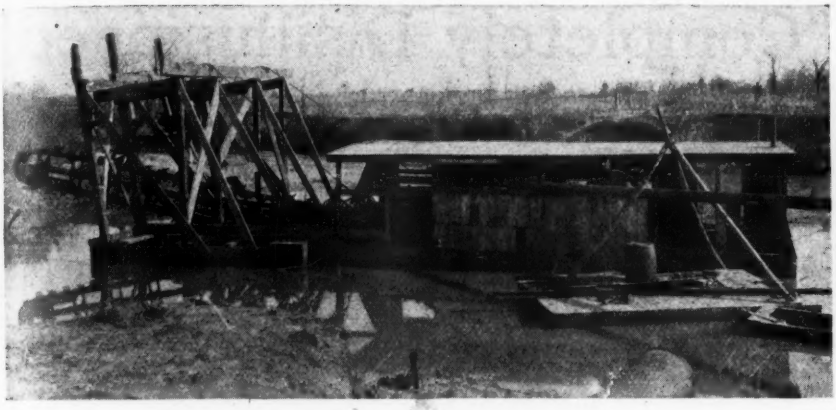
The material is taken out with a centrifugal pump to which is added an agitator of the endless chain type. This last is about the most notable feature of the plant and its addition to the regular equipment made up the greater part of the improvements referred to above.

This device is the invention of Martin Swintek, and engineer of wide experience in sand and gravel pumping operations. It is manufactured by the American Traveling Suction Screen Nozzle Company, Eddyville, Iowa, and sold by W. H. K. Bennett, 20 E. Jackson Boul., Chicago.

Its principal function is to break up hard gravel deposits so that the pump can handle them, and bring down bet-



The Screens



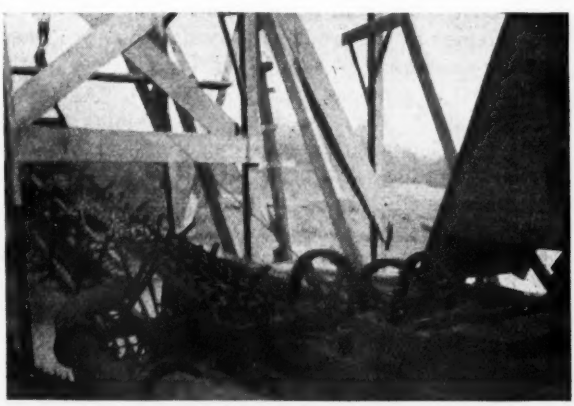
Dredge equipped with endless chain agitator

ter gravel to the nozzle, but it also serves the other useful purpose of eliminating oversize materials at the very beginning of the operations. It is thus a combined cutter and grizzly and its operation at this plant has shown its capacity to handle both these jobs satisfactorily.

The nozzle is controlled by a hoist made by the American Hoist and Derrick Company. The pump is an 8-inch Swaby, made by the Swaby Manufacturing Company of Chicago. Both these pieces of equipment are belt-driven by two Fairbanks super-Diesel oil engines of a combined capacity of 60 horsepower. These engines are started by compressed air produced by a Cameron compressor. Pressure is automatically renewed as the engines run and thus almost the flexibility of electric motors is attained. The centrifugal pump is primed by a small Gould pump.

The pipe line is carried by post supports to the tipple, which opens two loading tracks, one for sand and one for gravel. This tipple is 33 feet high, though the highest screen is but 29 feet from the top of the rail. This gives a total lift from the water line of about 54 feet. Stationary screens are used, 4x 12 feet in size.

These are placed one above the other and the grading of the product is secured by mixing the screenings from the various screens. As the percentage of oversize does not run very high there is no crusher, and the large material is piled at the bottom of the tipple, an occasional sale preventing the pile from growing too large.



Viewing the agitator from the deck

"Completely Disillusioned"

Experience of Contractors With Temporary Private Pits an Expensive Experiment

WITHIN the last few years there has been in a number of places a growing tendency on the part of a number of paving contractors to "cut around" the commercial producer and take from pits, which they would open up for each job, the aggregates needed for the making of their concrete. The idea underlying the movement was that the contractor would save for himself part of the producer's profit, would insure a steadier supply of material and cut out the heavy expense of a railroad haul, which would in such a case be unnecessary.

Many contractors, after making a thorough trial of the plan, have been completely disillusioned. They have found that the expense of railroad hauling was equalled by the expense of erecting, operating and later dismantling their plants, by heavy depreciation and the later uselessness of the equipment, by preliminary unproductive labor, such as stripping, etc., and by losses on account of rejected materials. They have found that the supply of material, far from being as steady as when they got it from commercial producers, was much more uncertain and that their road-building jobs were often seriously delayed by shutdowns of the gravel plant, brought about by conditions unforeseen at the time operations were begun. It is also a matter of fact that sections of road built with aggregates produced in these private pits do not compare well with sections of road, sometimes on the same job, built of materials furnished by a commercial producer.

Notable among the places where the private pit idea has been tried out is Wisconsin. The splendid gravel deposits of the state gave rise very easily to the idea that almost any bank that was seen to contain aggregates could be worked profitably. Many locations were surveyed by the State Geological Department and a number of these were made fields of operation by contractors who were putting in concrete roads nearby.

Recently PIT AND QUARRY had an opportunity to interview a number of these contractors and get a little insight into the conditions brought about by this attempt to cut around the commercial producer. A few of these observations are set forth in the succeeding portions of this article.

It must be remembered that there is a great disinclination on the part of any man, especially when he knows he is talking for publication, to admit that the methods he has been pursuing for a period of time have been anything but successful. Again, a season of production work has given some contractors the attitude of competitors of the commercial producer and, as such, unwilling to make admissions favorable to this body. For these reasons it will be readily understood that the evidence in favor of the commercial producer's case has not been in every instance stated as strongly as the actual facts would warrant.

The idea that washed gravel is necessary for good concrete does not seem to be properly understood in many quarters in Wisconsin. Neither does the necessity of a uniform mix appear to be appreciated at its true value in all cases. One producer stated that unwashed gravel containing as much as 7 per cent of clay, silt and other impurities was good enough for any road. Another

said that the proportions of sand and gravel in the pit run stuff he was using was uniform enough throughout for good results and could be used just as it was taken from the pit.

The number of persons who have these ideas may be judged by the fact that there are some 70 pits in and around Milwaukee that have no washing apparatus and only 6 or 7 that have equipment for washing their material.

When contractors who opened pits for the production of gravel for their various road-building jobs undertook the work of operating gravel plants, many of them did not seem to be sufficiently impressed with the idea that the operation of a gravel plant is a very risky venture, that deposits may become depleted very quickly, that they may not run uniformly, and that certain gravel, while correct in size and appearing in good quantities, may require washing before it is fit for concrete work.

All these chances the contractor should leave to the producer as the hazards of one particular business, which the established producer can set himself to overcome. Sometimes even the commercial producer runs into conditions of this kind, as witness the experience of the Waukesha Lime & Stone Company.

SEVENTEEN FEET OF CLAY

This concern had operated a commercial pit for years. They knew their business thoroughly, were "gravel-wise" in a high degree. They knew the hazards of the business and so, when they decided to experiment with a favorable looking open face about ½ mile long close by the plant, they knew, better than any contractor could, that it was just an experiment and as likely to prove a failure as not. The bank in question was a continuation of the one they had been working and, from all indications, held as valuable a deposit. They test pitted it and the results were favorable. And so, they bought the land and put in a shovel. It was not long before they ran into a streak of clay 17 feet thick. And they had to move 3,000 yards of the stuff before they got back to good gravel again.

With them, though, that was merely one of the chances of an established business. They were prepared for such eventualities. And in the meantime they were producing gravel without interruption at the other pit.

Could a contractor who would have to charge all his pit expense to one job, hope to "come out" under such circumstances? And if he did tackle the job of digging out all that clay to get to the good gravel, think of the delays thus brought about in his roadbuilding job.

As a matter of fact, the experience of the McGucken Construction Company of Milwaukee was quite similar. This concern undertook the operation of a pit to supply gravel for a five mile road in Walworth County and, taking a preliminary inspection of the ground in which the material was thought to be as furnishing a true index to the character of the deposit, put in equipment that must have cost them in the neighborhood of $10,000. They were all prepared for steady production and had their plans built around the idea that the indications of quality which the pit gave would be verified in the actual findings. A large quantity of material was expected, two crushers were installed, there were screens, bins, hoists, etc.—everything but washing equipment, which, on account of the apparent purity of the deposit, was considered unnecessary. But trouble began after the plant had been in operation a short time.

The material did not come out clean, contained a larger amount of clay

than the state specifications called for, and was accordingly rejected. The company was told that there was little doubt but the material could be used if a washing plant were installed, but they finally finished the job with material furnished by a commercial producer.

DIFFERENCE EASILY NOTICED

An interesting observation in passing is that made by a Wisconsin gravel man that a difference between the parts of the road built with washed and unwashed gravel can be discerned without much difficulty.

Fortunately for the McGucken Company, their contract protected them against loss in changing over from the use of gravel produced at their own pit to that furnished by the commercial producer. But the job was greatly delayed and thus one of the main reasons for the opening of a private pit was found not to apply.

Another experience that illustrates well the uncertain character of a gravel deposit is that of the Bates and Rogers Company of Chicago, who had the contract for State Trunk Highway No. 19 between Hubbelton and Waterloo. They opened up a pit close by the job and expected to take from it sufficient material to finish the work. But after they had gone down a distance of less than 20 feet and had finished somewhat less than half of their 5-mile job, the gravel gave out and they ran into clear sand. At the present time the job is closed down and will not be reopened until next year. After the use of gravel from the private pit was given up a small amount of gravel furnished by a commercial producer was used and the difference in the jobs made possible by the two classes of material is apparent. That part which is made of gravel from the private plant is already pit marked, while that in which the commercially produced gravel is used is smooth and clean.

Last year the Appleton Construction Company of Appleton, Wis., undertook the building of S. T. H. No. 15 in Dodge County, from the Washington County line to the town of Theresa. Their plan was to produce sand and gravel from a pit located at about the center of the projected roadway which was five miles in length, making the longest haul not over three miles. The plant investment was about $13,000 and the gravel in the pit, according to Mr. B. C. Koepke, was of very good quality.

At the same time that the Appleton Construction Company began operations on this job, Mr. Joseph McCarthy of Kaukauna, Wis., undertook the construction of another road of about 3 miles, not far from the Appleton job. This concern used only aggregates furnished by a nearby commercial producer.

Remember that the Appleton Company was, according to their own statement, operating under favorable pit conditions. Mr. Koepke stated that the pit held gravel of splendid quality and in quantities sufficient for a job of twice the size of the one undertaken.

COMPARE THESE TWO RESULTS

But between the two jobs undertaken at the same time a short distance apart, and with about the same roadmaking equipment, let us make the only comparison that really counts—that of net results.

The Appleton Construction Company's job is not finished yet, the McCarthy Company has wound up its work and has also completed another 5 mile job at Shawano, Wis.

The trouble that the Appleton Company had, as nearly as we can figure it out, was rejections. They were at the mercy of inexperienced inspectors

and opinionated county highway commissioners, and rejected material meant so much of *their* money tied up, perhaps *their* plant tied up until the affair could be readjusted.

If they had been buying the aggregates of commercial prooducers the chances would have been preponderantly against rejections in any case. If a rejection of material was made, it would be somebody else's trouble, somebody else's money tied up, and meanwhile the job would go ahead.

A case in point. The Appleton Company was notified of the rejection of a lot of material totaling about 500 yards and worth about $3.00 per yard. The company protested and got no satisfaction. The County Highway Commissioner finally consented to come out on the job and show just why the material had been rejected. After looking over the pile for a long time he finally ran across a few stones that would not pass inspection and stated that those furnished the reason for rejection. A number of experienced men were taken out and shown the material. They pronounced it all right and a protest was filed with the county board. It proved of no avail.

All of which illustrates the truth of our contention that, even though the contractor can produce perfect materials it is better for him not to do so. He has the woes and worries of one job on his hands already and he is not improving matters at all by assuming the added risks and uncertainties that belong to a separate and independent enterprise.

A BUSINESS OF ITS OWN

That the production of aggregates for concrete work is a business that the contractor should leave to commercial plants is the opinion of many contractors who have had opportunities to study the subject at close range. The following extract from a recent letter from The McCarty Construction Co., is typical of a number of statements to the same effect. "We bought considerable concrete material from the commercial plants of eastern Wisconsin this past season. I must say that we were troubled very little with delays on their account. I have seen so few successful private contractors' material plants that it has rather convinced me that the producing of concrete materials is a business of its own. Judging from my present knowledge I would say that, all things considered, the commercial plant is the most satisfactory arrangement for the contractor."

The commercial producer's whole success is bound up in his producing materials that will not be rejected. It is not a department of his business, it is the business itself and he *can't* have his material turned down.

The case of the Appleton Construction Company is not an isolated one. Many other contractors have had similar disgusting experiences, which in almost every instance had their influence on the final outcome of the job.

There is the case of Mr. Fred Hildebrand of Milwaukee, Wis., who built 3½ miles of concrete road near Berlin, Wis. Two lots of material laid down on the job ready for mixing were rejected by the inspectors. On the same day the men from the Highway Commission were analyzing samples at the pit. They tested material taken from the same spot as the rejected stuff and found it entirely satisfactory.

WORRYING IS THE PRODUCER'S JOB

Let us see what that means. Either the material was right and the inspectors wrong, or the inspectors right and the material wrong. The producer

depends upon both, the material and the inspector, for the successful completion of his job. He ties up *his* money on the gamble that the material is right. He is assuming the risks of another and separate business. Why should he not let the commercial producer, who is prepared for any contingencies in his own line of business, do the worrying?

The commercial producer is an established business man. He has a permanent plant, fully equipped for the production of material that *must* pass the inspectors. He does not have to charge against each large job that he undertakes the erection and dismantling of a plant and the preparation of a pit for the production of gravel. His establishment is always ship-shape, ready to produce gravel, and will be producing next year and five years from now at the same place.

Right there comes in a point that many contractors overlook, but which they would do well to remember. Their plants are not permanent, they know they will not be producing gravel at the same place five years or even one year hence. Consequently, *they should charge against each job the entire cost of the pit equipment.* Why? Well, for one reason, because, at the time of building, they do not know whether they will be able to use this equipment again.

Again the commercial producer's case is strengthened. He charges the cost of equipment against the amount of material that it can produce until worn out, with no costs for numerous set-ups, tear-downs and haulings at intervals. He gets the full value out of his machinery. The contractor who does not analyze all these costs as carefully as he should *is not producing gravel as cheaply as the thinks he is.*

Mr. Cheney, of the McCullough-Cheney Company, of Minneapolis, who has had some experience in the operation of private pits, says, in effect: "In order for a contractor to operate a local pit in conjunction with a paving job and come out as he ought financially, he must necessarily figure the entire cost of his pit equipment against the job, for an occasion when he may again be able to use it may never arise. Then, too, the production of material is an independent operation and he should figure a profit on this material, independently of his profit on the road work. He should also be protected by his contract against disappointments in the quality and quantity of material in any deposit worked in such a way that, should he find it necessary to change his methods, the state or county will reimburse him for any added cost."

IT'S A GAMBLE AT BEST

Just reflect over that last statement. How many highway commissions do you suppose will guarantee a deposit of gravel in a local pit, even though it is being worked on the strength of surveys made by them? And yet, that is the only thing that will take the gamble out of the opening of a local pit for *temporary use.*

No, as a rule, counties, municipalities and states know too well the uncertainties that surround the gravel producer, sometimes even when he has the finest kind of equipment, which will meet all conditions except a lack of gravel.

As a matter of fact, quite a number of County Highway Commissions have given up the operation of county pits for the production of concrete aggregates. One of these is the Highway Commission of Milwaukee County. Mr. W. F. Cavanaugh, Commissioner, says that he can buy washed gravel of commercial producers more cheaply than the county can produce it. Milwaukee county

uses only washed materials for concrete work, and pit run material for nothing but shouldering.

Some of the counties in Wisconsin that are producing their own aggregates surely have a mistaken notion of the *true* cost of the materials they turn out. The man who is operating the Sheboygan County pit produced a long article, which appeared in the Sheboygan Press, in which he gave out figures showing the extreme low cost of production in that particular pit. His figures must have been wrong, for the price of gravel in bins, as given, was lower than the lowest amount at which the steam shovel could possibly pick it up.

Some of these county pits, operated on a day labor basis to determine production costs, did not turn out as well as was hoped and expected. Deposits did not "hold up" as it was thought they would, in some cases a number of setups were required in a single season because of the character of the ground, etc.

A case that illustrates well the variability of deposits worked by the county pits is that furnished by the Washington County plan. In this instance the trouble was oversize stone, boulders which could not be handled by the dragline bucket and which necessitated the installation of a steam shovel. The whole deposit was sprinkled thickly with these boulders, too large to crush and sufficient in quantity to be troublesome through the entire time that the deposit was worked.

This Washington County pit also had some difficulty on the score of quality with the material it produced. Some gravel was sold to a few contractors, who were far from satisfied with their purchases.

JOBS GREATLY DELAYED

Let us get back to the subject of gravel production by contractors by quoting one contractor whose attitude is typical of a large body of men in his line of business. Mr. Driscoll of the Garvey-Weyenberg Construction Company of Appleton, Wis., says that his company regards the production of sand and gravel as just as much a distinct business as the making of roads. He says it is their observation that contractors who have been operating their own pits have not come out so well, have had much more of their material rejected than others have had, and have had their jobs greatly delayed in many cases. This concern now has a 7 mile job in Pennsylvania and a 6 mile job in Michigan, both practically complete.

Mr. Deutsche, secretary of the Wisconsin Municipal Contractors' Association, made some interesting observations on the experiences of contractors who have been operating private pits. He says his personal opinion is that the idea is wrong, that a contractor has enough to do to run his own business properly. He stated, too, that the majority of contractors now favor the use of material furnished by commercial producers.

From Mr. O. C. Hubbard, secretary of the Wisconsin Mineral Aggregate Association, we learned little; that is, little that was new, for his views naturally coincided with our own. He stated, however, that the continual encroachment of contractors in the producers' field will soon result in the entry of a number of producers in the contracting field.

Mr. Weymouth, Divisional Engineer of the State Highway Commission, with offices in Milwaukee, says, in effect, that the plan of opening private pits has been truly successful in about half the places it has been tried in the

9 counties that comprise his division. Mr. Howard, Asst. Divisional Engineer, stated that the contractor has not competed with the commercial producer as successfully as was expected and that the only place in which the former might hope to have an advantage was where railroad rates were very unfavorable or the nearest commercial pit very disadvantageously located.

The statement of Mr. Brodd, representing the Portland Cement Association in Milwaukee was, of course, that washed gravel was so much better for the making of concrete that there was really no comparison between the two—that they were bending every effort to get more general acceptance of the idea that all gravel intended for use with cement should be washed.

Mr. Buetow, in charge of the Materials Division of the State Highway Commission, throws an interesting sidelight on the profits of contractor-producers by repeating the statement of a member of the Appleton Construction Co. above referred to. This statement was to the effect that the Appleton Company's investment was $14,000 and that an amount just equal to this $14,000 had been saved in railroad hauls by the installation of the private plant. Get that clearly—plant investment $14,000, saving in railroad hauls $14,000.

Which means that this company for a whole season assumed the additional cares and worries of another business, did considerable hard work over and above the arduous work of road building and received in return for this extra exertion a second hand plant of doubtful utility, chargeable with a heavy depreciation for the year's work and including as a considerable portion of the total amount, the value of certain construction and erection work which must be considered not as an investment but an expense.

Mr. A. R. Hirst, State Highway Commissioner, while claiming success for the private pit plan as a whole, stated that the operation of the plan was not without its disagreeable feature and, in general, private pits had not shown up during the season just closed as well as they had in other seasons. He said that in general the contractor was not greatly in favor of opening up a private pit and looked upon gravel production as a business separate and distinct from his own—that he went into it only when he had been convinced that it was the only way in which he could come out right.

But, if the contractor could truly estimate the expense and uncertainty that attach to gravel plant operation on a small scale, he would see that this is not the plan that will eventually bring him out right.

Gravel production is a business which requires more knowledge and more willingness to take chances than the average layman believes. It is a reasonably safe business only for the man who knows it—and the general run of contractors and others who undertake the management of plants are not men who know the business. They are, in most cases, entirely without experience and the results of the operations have varied directly with the degree of expertness shown by the management.

All things considered, the contractor is best served in the important matter of supplying concrete aggregates by the man who *must* operate his business efficiently and continuously, the commercial producer.

Portland Cement Output Increases in October

THERE were appreciable increases in both production and shipments of portland cement in October, 1921, notwithstanding the seasonal trend. The production exceeded that of October, 1920, and according to available statistics was the largest ever recorded for a single month. The production for the first ten months of 1921 was greater than the production during the corresponding period of 1920 and about 10.5 per cent in excess of the average for the same period during the five years 1917-1921.

The shipments for October exceeded the production and established a record. The shipments during the ten months ending October 31 exceeded those during the corresponding period of 1920 by about 1.5 per cent and exceeded the average for the same period during the five years 1917-1921 by over 11.3 per cent.

Stocks of finished cement at the mills at the end of October were approximately 5,348,000 barrels, compared with 6,953,000 barrels at the beginning of the month and with the average of about 6,014,000 barrels for October during the last five years.

The production of clinker, or unground cement, in October was approximately 9,891,000 barrels. Clinker production for the ten months amounted to approximately 82,419,000 barrels.

The statistics shown in the following table, prepared under the direction of Ernest F. Burchard, of the United States Geological Survey, are based mainly on reports from producers of portland cement and in part on estimates.

The Bureau of Foreign and Domestic Commerce, Department of Commerce, reports that imports of hydraulic cement in October amounted to 11,448 barrels, valued at $32,940; the total for the first ten months of 1921 was 76,878 barrels, valued at $270,180. The exports of hydraulic cement in October were 79,878 barrels, valued at $254,914; the total exports for the ten-month period were 1,013,517 barrels, valued at $3,784,370. The exports in October went to Cuba and the other West Indies, 41,395 barrels; South America, 19,989 barrels; Mexico, 13,003 barrels; Central America, 4,487 barrels; Canada, 1,278 barrels; other countries, 726 barrels. The exports for the whole year 1920 were nearly 3,000,000 barrels.

Production, Shipments and Stocks of Finished Portland Cement in First Ten Months of 1921

Month—	Production (barrels)	Shipments (barrels)	Stocks at end of month (barrels)
January	4,098,000	2,549,000	10,300,000
February	4,379,000	3,331,000	11,400,000
March	6,763,000	6,221,000	12,000,000
April	8,651,000	7,919,000	12,600,000
May	9,281,000	9,488,000	12,450,000
June	9,296,000	10,577,000	11,150,000
July	9,568,000	10,301,000	10,414,000
August	10,244,000	12,340,000	8,280,000
September	10,027,000	11,329,000	6,953,000
October	10,506,000	12,114,000	5,348,000
Total	82,813,000	86,159,000	.....

Imports and Exports of Hydraulic Cement in First Ten Months of 1921, in Barrels

Month—	Imports	Exports
January	14,678	225,561
February	18,269	84,220
March	7,681	97,302
April	1,540	93,009
May	2,035	82,409
June	1,657	109,331
July	8,455	81,091
August	10,988	84,538
September	5,177	84,668
October	11,448	79,878
Total	76,878	1,013,517

New Illinois Plant

Pumping Good Grade of Gravel Near Marseilles

THE gravel plant of W. H. Spicer, at Marselles, Ill., has a number of interesting features, some of these in the plant itself and some in the deposit of gravel that is being worked.

The works are located about two miles east of Marseilles, Ill., on the Rock Island Railroad along the historic Illini trail. It is also reached by a fine asphalt road which permits the shipment of a considerable amount of material by truck to nearby users.

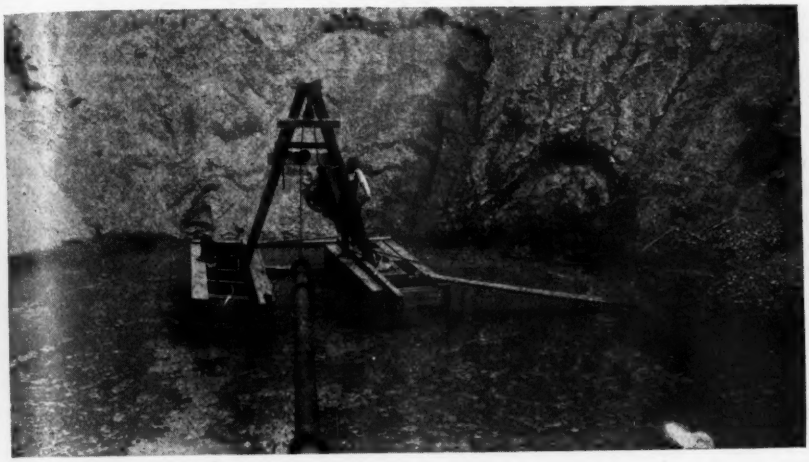
The work of building the plant was started last fall and operations were begun before all the construction work was finished. Gravel was turned out before the shed which now encloses the pump and engine equipment was built.

The deposit that is being worked is one which contains exceptionally pure gravel. There is very little clay, sand and oversize. About a year ago one of the Illinois state highway officials happened to be in the neighborhood and saw the material. He sent a sample to the state laboratory and an analysis made there showed the presence of only seven-tenths of 1 per cent of clay. On another occason an analysis found that the clay present in the deposit equaled only four-tenths of 1 per cent. The proportion of oversize gravel has been determined by the results of daily production as approximately 1¼ per cent.

The plant has a capacity of 300 cubic yards daily and has made as high as 60 cubic yards an hour when all conditions were favorable.

The pit is now about 30 feet deep, including a top stratum of almost 4 feet which is not particularly valuable. The deposit runs much deeper still and it is thus possible to get out a large amount of material without spreading the operations over a great extent of ground.

The gravel is taken out with an 8-inch Amsco pump and pumped under the road to the three screens used for eliminating oversize and for grading. The intake pipe in the pit, shown in one of the accompanying photographs, is held up by two boats and kept in the proper position for effective work by a winch which is in care of one of the men. Accordingly as the supply of water fluctuates, and the

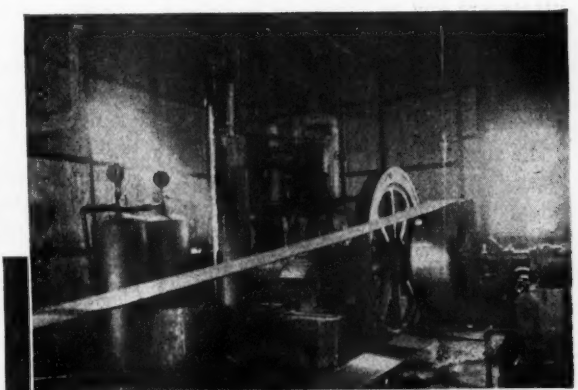


removal of gravel calls for a deeper sinking of the pipe, this man makes all necessary adjustments with the winch and an anchor line running to the side of the pit.

The pit gets its supply of water by seepage through the gravel, by returns from the screens and by the occasional pumping in of a quantity of surface water. Water coming back from the screens goes first into a settling basin, shown in one of the photographs, and from there through a pipe under the road and back to the pit. It is this matter of water supply that proves the only "fly in the ointment," an occasional shortage necessitating a suspension of operations until the supply can be renewed.

The plant is operated by a 100 h. p. Fairbanks-Morse semi-Diesel engine. This and the pump are under the care of one man. There are three stationary screens; one of perforated metal with 2¼ inch openings for eliminating oversize; the other two of woven wire, one a ¼x¾ inch, and the other a ½ inch.

Mr. Ben L. Whitney formerly with the Byers Machine Co., has opened office at 528 Detroit Savings Bank Bldg., Detroit, Michigan, and will represent the Orton & Steinbrenner Co.



French Quick Hardening Cement

IN THE course of the World War a cement of very remarkable type and properties was put into use by the French for special military purposes. Its high technical value, in certain limited fields, prompted Mr. Edwin C. Eckel, consulting engineer, Washington, D. C., to describe it at length in a recent issue of Engineering News-Record, from which is taken the information here given.

As an introductory summary Mr. Eckel says that it is a lime aluminate, differing from normal portland cement in the almost total absence of silica; that it is prepared by actual fusion, not by mere clinkering; that it is almost white in color; and that it will harden with such rapidity as to make a good heavy-gun platform within 24 hours. It will be seen that it offers certain possibilities for other than military uses; and that products of this general type may become of interest both to American cement manufacturers and to American engineers.

The Lafarge quick-hardening aluminous cement was marketed as *ciment fondu* or fused cement, and for the sake of brevity that term will be used.

The fused cement is made in a small blast furnace, which is charged with coke, limestone and bauxite. When the furnace is in steady operation it turns out from ten to fifteen metric tons a day of fused slag or clinker. This slag, cooled and ground, is the Lafarge fused cement. In composition it does not vary greatly from

Lime	50 per cent
Alumina	40 per cent
Silica, etc	10 per cent

The silica noted comes in chiefly from the impurities of the coke, but in lesser part from the bauxite, and to a very slight extent from the limestone used. The fused cement, as will be seen from the above note, is far lower in lime than the normal portland cements, a characteristic which it shares with the high-iron cements occasionally made and used.

So far as cost of manufacture is concerned, the fused cement can obviously be made at least as cheaply as a normal portland. Its uses will be determined then, not by cost, but by its special characteristics, which give it value in certain fields of work, but limit its use in other lines. We may note briefly some of these characteristics.

The fused cement has a normal setting time, falling in this regard within ordinary portland cement specifications. It can therefore be mixed and worked without taking any extraordinary precautions.

Its hardening, however, takes place with far greater rapidity than does that of a normal portland cement, so that a 24-hr. test will give results for the fused cement which are rarely obtainable with portlands under 28 days. In saying this it must be kept in mind that I am speaking of French cements used in French climate. The average American portland, used in the United States, will both set and harden faster than the usual European portland employed abroad.

Considering the composition of the fused cement, its most remarkable property perhaps is its resistance to the decomposing effects of sea-water and similar solutions, for until the Lafarge cement was introduced there was a tendency to ascribe the breaking up of portland cement in sea water to its content of alumina, and to search for cements low in alumina. Yet here we have a cement with a very abnormal alumina content which seems to be perfectly resistant to marine action.

In laboratory tests, for which rec-

ords of nine years' standing are now available, the fused cement has been kept in three solutions: (1) Sea water, (2) water saturated with lime sulphate and (3) water carrying 1.2 per cent magnesium sulphate. The cubes kept for nine years under these three very trying conditions are absolutely intact.

Briquets of neat cement, composed of fused cement to which gypsum was added in all proportions up to 50 per cent, have been kept in water since 1908 without the least signs of disintegration.

In view of these facts it seems evident that we must broaden our ideas as to the possible modes of securing protection of cement against the action of sea water and of other strong solutions. I was not able to secure data regarding the resistance of the fused cement against highly alkaline or acid solutions, a matter which is yearly becoming of greater industrial importance. It is to be hoped that some laboratory which has the facilities for carrying out such tests may take up the matter in proper detail.

The Universal Crane Co., Elyria, Ohio, announces that Mr. Geo. L. Sawyer, formerly sales manager of material handling machinery for Barber-Greene Company, of Aurora, Ill., has been appointed to represent them in the New York field in the sale of Universal cranes. His offices are at Allied Machinery Center, 141 Center St., New York City. Keen interest in the Universal crane has been shown throughout the territory due to the crane's adaptability to so many types of mountings and its great flexibility and economy in almost all material handling fields.

R. E. Skinner Company, Inc., 70 East 45th Street, New York, have issued a booklet entitled, "Cutting the Unreckoned Costs." This company is the manufacturer of Lion Paw belting, and the book, of course, refers to the cutting of costs in the matter of belting installation and operation. The book does not confine itself to mere claims of superiority, but gives the results of a number of tests with different kinds of belting.

The California Gypsum Corporation, with offices at 321-323 Central Building, Los Angeles, is erecting a plant at Coyote Wells, California, which they expect to have in operation by March, 1923. The officers are: Charles F. Gutbridge, president; C. F. Fuller, vice-president; John Scheufler, secretary-treasurer.

"Far Reaching Influence," Says Coppock

"It is a pleasure to me to give expression to my favorable impression of PIT and QUARRY, which has placed the sand and gravel industry as a whole in its debt for the many years of conscientious effort on the part of your magazine to better the conditions of our industry," says Mr. F. D. Coppock, President and General Manager of the Greenville Gravel Company, Greenville, Ohio.

"It is hard to estimate the far reaching influence of a publication such as yours in bringing recognition to a new industry and molding favorable public opinion on the big questions which we have had to contend with during the past few years.

"I wish to assure you of my very best wishes for the continued good offices of PIT and QUARRY."

F. D. COPPOCK

Pyramid Cement Plant Under Construction

DES MOINES, a logical point from which to distribute Portland cement to an extensive territory, will shortly be on the cement mill map as one of three cities in the United States in which a kiln 240 feet long will be in operation. The Pyramid Portland Cement Company will soon be able to send from its plant at Valley Junction near Des Moines cement produced at a considerable reduction in cost made possible by this new kiln.

The Pyramid Portland Cement Company has been incorporated with an authorized capital of $2,000,000, most of which has already been sold. Among the guiding spirits of the new company are a number of men of high standing in the financial circles of Des Moines, and one at least whose activities in the production of cement have made him a figure of some importance in the industry.

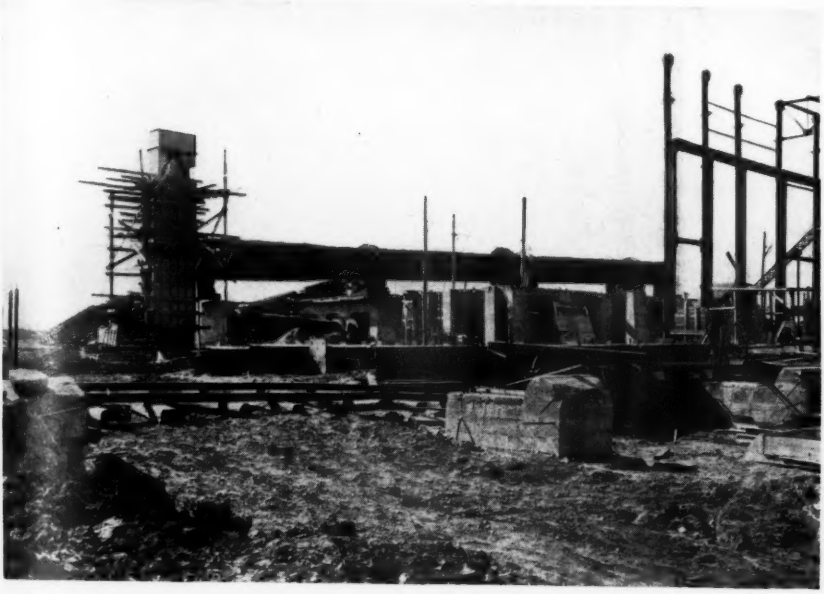
This man is the president of the new concern, Mr. E. Struckman, who, since his graduation in Copenhagen, Denmark, in 1896 as a mechanical engineer, has devoted most of his energy to the production of cement and has been connected with a number of Portland cement enterprises in this country and abroad.

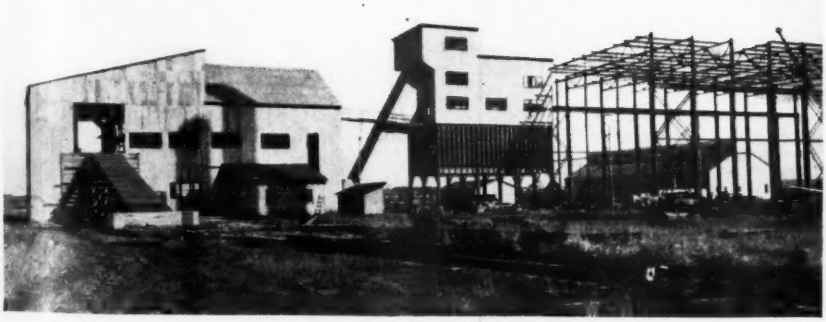
In selecting Des Moines as an ideal location for the new plant, its directors had in mind a good many things. There is a good clay deposit about three quarters of a mile from the plant, on the company's property of 103 acres, and enough limestone in the quarry at Gilmore City to permit the manufacturing of 6,000 barrels of cement a day for 150 years. The company's quarry holdings cover 82 acres and the material contained therein has been shown by engineering tests to be 99 per cent pure lime. The ledge is 216 feet thick and located close enough to the surface to make the stripping a rather unimportant feature of the work. Then, too, the cost of coal in this section of the country is low, there is an abundance of water, and an adequate supply of labor is close at hand.

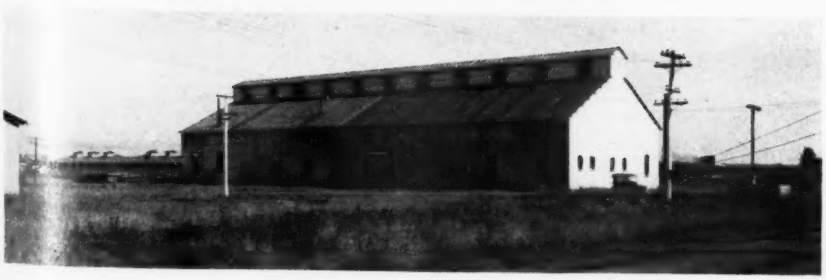
In return for the benefits which the mill will confer upon the city of Valley Junction by affording additional opportunity for employment, the city has remitted the taxes of the Pyramid company for 10 years. Another important advantage that has been secured is a 20 year contract with the M. & St. L. Railroad, which gives the company a special rate on trainload lots between the limestone quarry and the plant. The company will take care of its switching at both ends.

There is still considerable work to be done before the plant will be producing cement. At present the machine shop is the only building that is actually finished and with machinery running, although the rock crusher building is up and the car dumper, rock crushers and elevators in place, and ready for operation. Except for the machine shop, there will be but one building. Interconnections between the point where the various mill operations will be carried on will have the effect of making of the whole a single structure about 600 feet long and 200 feet wide.

It is not possible at the present time to give an adequate idea of the shape that the plant will finally assume, for the photos were taken about two months ago and show the works in a very unfinished condition. As will be seen, one of the two kilns and







Constructing the Plant of the Pyramid Portland Cement Company, Des Moines, Iowa

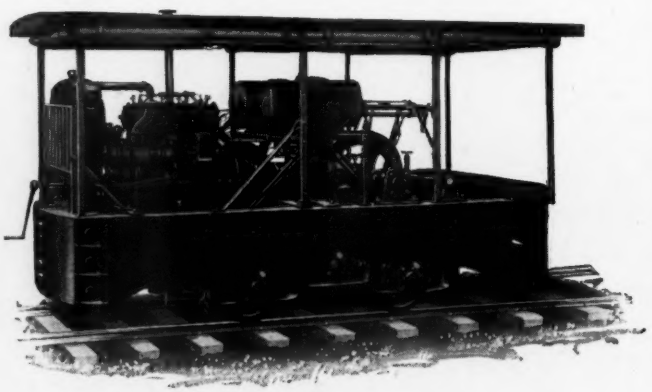
Announcing

New Plymouth Gasoline Locomotive

MODEL CL-3½ TON

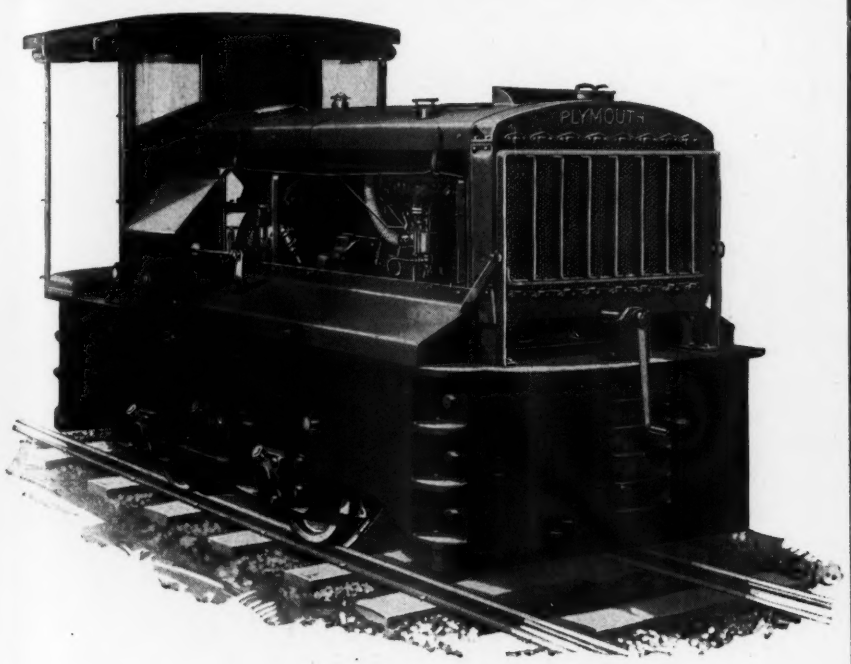
We offer to the material handling public our Model CL PLYMOUTH Locomotive as the result of our accumulated years of experience, both in shop and actual service. It has always been our policy to keep step with industrial requirements and in this new design we submit for your consideration the important and superior features as detailed below.

THE FATE-ROOT-HEATH CO.
PLYMOUTH, OHIO



NEW PLYMOUTH GASOLINE LOCOMOTIVE
MODEL CL—3½-TON

With straight canopy, adapted to open season work or warm climates. Admitting greatest possible accessibility and unobstructed vision for driver in all directions.



New Plymouth Gasoline Locomotive

MODEL CL-3½ TON

Buda Engine—rugged, powerful, heavy duty, with large crankshaft, large bearings, removable cylinder head, heated intake manifold and full force feed oiling.

Extra large Radiator with Modine sectional core allowing removal of section if injured without interfering with operation. Cooled by powerful 4-blade fan.

Improved telescopic Coupling with shock absorbing provision between engine and transmission.

Drive or Disc Shaft carried in two bearings, relieving engine from all strains or stresses, resulting from one bearing shaft.

Double width Chain on main drive affords large margin of strength.

Positive and direct flow of sand thru steep angle pipes, with valve for each wheel acting as agitator also.

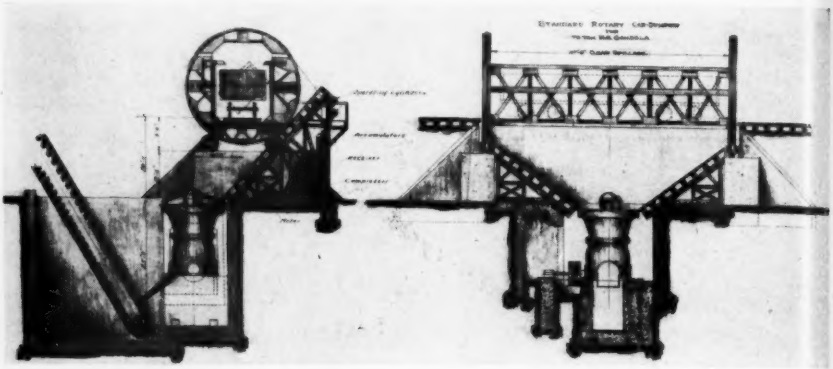
Heavy, rigid, re-inforced Frame, with low hanging bumpers, affording protection to sprockets and chains, also against wheels sinking between ties in case of derailment.

All bearings outside of engine are self-aligning.

Greatest Accessibility and Simplicity throughout.

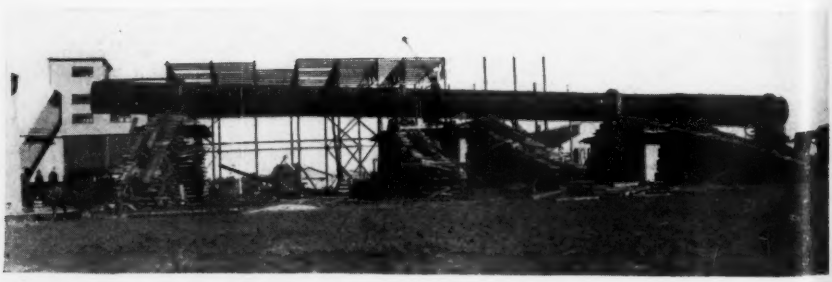
EFFICIENT—RUGGED—DURABLE.

Ask for Descriptive Bulletin



Installation of Rotary Car Dumper at Pyramid Plant

Elevator to Secondary Crushers



The Kilns are 240 Feet Long and 10 Feet in Diameter

the cooler which it will feed are in place. The two stacks, each 216 feet high, are already up. These stacks, made of reinforced concrete, were erected by the Weber Chimney Company.

The quarry operations at Gilmore City will consist of blasting out the stone and loading it by steam shovel into railroad cars. For this work a Cyclone blast hole drill and a Bucyrus shovel with a 3½ yard bucket will be used. One of the Pyramid Company's locomotives will also be kept busy around the quarry switching cars.

The clay deposit will be worked in much the same way, except that the haul will be only about three-quarters of a mile.

When the cars of material reach the mill they will be taken up the inclined trackway shown in one of the photos to a rotary car dumper made by the Car Dumper and Equipment Company of Chicago. This equipment is set on a hump almost directly over the crusher and cars will be delivered to and taken away with barneys. It will be operated with pneumatic-hydraulic control and will afford a clear spillage of about 45 feet.

The primary crushing will be handled by a 36-inch McCully gyratory crusher furnished by the Power and Mining Machinery Company of Milwaukee. The crusher pit is 32 feet deep and into it reaches the elevator which will carry the crushed rock to the storage building. This elevator is equipped with buckets 54 inches wide arranged on the endless belt plan. It is about 60 feet long and operated at an angle of 45 degrees. The Stephens-Adamson Company of Aurora, Ill., are the makers.

After the limestone has passed the primary crusher and the elevator it goes into a secondary crusher made by the Dixie Manufacturing Company of St. Louis and thence to the rotary screens.

The screens were furnished by the Austin Manufacturing Company of Chicago and are of 60 inch by 30 foot size made up of a 12-foot section with 1¼-inch perforations, a 10 foot section with 2-inch perforations and an 8-foot section with 3-inch perforations. There is also an 11-inch dust jacket with ⅜-inch perforations.

After the correct quantities of limestone and clay are measured out, they will be passed on to the grinding machinery and from there to the large slurry bins which are now in process of construction.

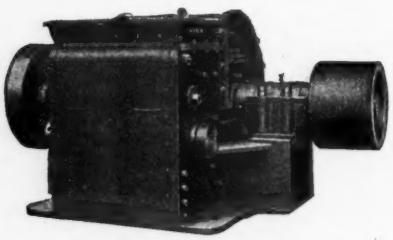
There will be 5 ball mills and 3 tube mills, all furnished by the F. L. Smidth Company of New York.

The material will then go to the 240-foot kilns. These kilns, 10 feet in diameter and weighing 675,000 pounds each are relied upon to make a great saving in the cost of cement produced in them. They are designed to get the utmost efficiency of the heat necessary to calcine cement. A fea-

Primary Crusher

ture of these kilns is the enlarged burning zone near the fire end with an inside diameter of 11 feet 3 inches and extending from the end about 60 feet, the last 20 feet of which nearest the center is the point of greatest effectiveness. They were furnished by the Power and Mining Machinery Company.

At the time the big kiln now erected was hoisted into place the work was done by a railroad train wrecker manned by a crew from the railroad shops, together with a force of the Pyramid Company's men and aided by the Pyramid Company's two locomotives. In placing this 675,000 pound



Dixie Crusher

piece of equipment, one end of it had to be raised to a height of nearly 40 feet. A similar piece of work remains to be done when the other kiln is put in place.

The red hot clinker, as it comes from thes huge kilns, will go to coolers, furnished by the Power and Mining Machinery Company, and will then be passed on to inside storage bins.

Pulverized coal will be used for firing. F. D. Cummer & Sons Co., of Cleveland will furnish the coal dryer, and the coal pulverizing equipment will be supplied by the Raymond Pulverizer Co. Coal blower equipment has not yet been decided upon.

The plant will be operated entirely by electricity which will be supplied by the Des Moines Electric Company. Allis-Chalmers and General Electric motors are to be used.

Explosives "Recovery"

Business for 1920 Showed Marked Increase Over Previous Year

THE production of explosives in the United States during the calendar year of 1920 showed a marked recovery from the slump in 1919. As reported to the Bureau of Mines by the manufacturers, the production (excluding exports) was 537,954,750 pounds, an increase of 120,320,280 pounds, or about 29 per cent, as compared with the preceding year. Of this amount 254,879,825 pounds, or 47 per cent, was black blasting powder; 229,112,084 pounds, or 43 per cent, was high explosives other than permissible explosives; and 53,962,841 pounds, or 10 per cent, was permissible explosives. As compared with the year 1919, there was an increase of 41 per cent in the production of black powder, 15 per cent in "high" explosives, and 39 per cent in explosives classified as "permissibles."

The quantity of permissible explosives sold in 1920 has never before been equaled, and the sales of black powder were, with one exception (1917), likewise larger than for any previous year. The quantity of "high" explosives sold in 1920, while considerably above that for 1919 and 1918, was still below normal.

The reports show that practically all classes of consumers used larger quantities of explosives in 1920 than in 1919. The mining industry consumed 75.1 per cent of all explosives in 1920 as compared with 75.3 per cent in 1919. The principal increase was in coal mining, an industry that ordinarily consumes over 80 per cent each of all black powder and permissible explosives and about 15 per cent of high explosives, or over half of these three classes combined.

Recent Patents

The following patents of interest to readers of this journal recently were issued from the United States Patent Office. Copies thereof may be obtained from R. E. Burnham, patent and trade-mark attorney, Continental Trust Building, Washington, D. C., at the rate of 20c each. State number of patent and name of inventor when ordering.

1,393,072. Front head for rock-drills. Lewis C. Bayles, Easton, Pa., assignor to Ingersoll-Rand Co., Jersey City, N. J.

1,393,257. Rock-drill. James C. Wright, Colorado Springs, Colo.

1,393,360. Spring-truck. Hollis H. Harris, Lorain, Ohio, assignor to Thew Shovel Co., same place.

1,393,361. Power-shovel. Hollis H. Harris, Lorain, Ohio, assignor to Thew Shovel Co., same place.

1,393,362. Power-shovel. Hollis H. Harris, Lorain, Ohio, assignor to Thew Shovel Co., same place.

1,393,363. Convertible excavating-machine. Hollis H. Harris, Lorain, Ohio, assignor to Thew Shovel Co., same place.

1,394,699. Scraper attachment for unloader-buckets. Cecil E. Van Syckle, Lakewood, Ohio.

1,395,048. Dipper-tooth. Walter S. McKee, Chicago, Ill., assignor to American Manganese Steel Co., Augusta, Ga.

1,395,089. Automatic ball-mill feeder. Harry H. Burhans, Newark, N. J.

1,395,647. Mining-machine. Nils D. Levin, Columbus, Ohio, assignor to Jeffrey Mfg. Co., same place.

1,395,716. Mineral or coal separating jig. Harry D. Kostenbauder, Aristes, Pa.

1,395,717. Sand, gravel, and stone cleaning machine. Frank & Irwin Le Cocq, Aberdeen, S. Dak.

1,395,959. Ore-crusher. John Herman, Los Angeles, Cal.

1,395,988. Drag-line scoop-bucket. Howard M. Sherwood, Vandalia, Ohio.

1,395,996. Mining-machine. Morris P. Holmes, Claremont, N. H., assignor to Sullivan Machinery Co.

Bucyrus Film

A new motion picture film has recently been produced under the direction of the United States Bureau of Mines.

"The Story of Heavy Excavating Machinery," produced in co-operation with the Bucyrus Company, depicts in a vivid way the many types of steam, gasoline, and electric shovels and other heavy excavating apparatus that are used in mining operations. This picture shows scenes in the iron mines of northern Michigan and the quarries of New England, and illustrates coal stripping operations in Ohio, and also drag-line and tower work in the conservation work along the Mississippi River.

Application for the loan of these films, to be shown for educational purposes, should be made to the Bureau of Mines, 4800 Forbes St., Pittsburgh, Pa.

Wire Rope You Can Identify

The Williamsport Wire Rope Company has adopted as an identification mark for its wire rope a "Telfax Tape Marker," a band of tape built right through the core of the rope, on which is printed the grade of the product. Different colors are used on the different grades, for quick identification.

Write to the general offices of the company, Peoples Gas Building, Chicago, for color chart and booklet.

Mine Car Hitchings

Monarch mine car hitchings form one of the staple products of the Macwhyte Company of Kenosha, Wis. This device is made in two strengths,

also in two styles—one for horizontal and one for vertical draw bar.

It is a simple device, with nothing to come loose or be lost, and can be used on any haulage system and on any grade.

Proposed Safety Code for Quarries in Wisconsin

THE Wisconsin Industrial Commission is preparing to issue a safety code for quarries.

In the tentative code as drawn up by the commission, in cooperation with several representative producers of the state, the term quarry in this connection is used to mean the place from which stone, rock, sand, gravel, or any material is removed from open face workings.

Hearings on this proposed code have been held at three points in the state, the last one being held at Milwaukee, at which a committee of the Wisconsin Mineral Aggregate Association, headed by John Sloan of the Wisconsin Granite Company, presented modifications which were recommended to be incorporated in the code. This committee was, in some cases, willing to go even farther than the framers of the code, in the direction of proper safety provisions.

The provision which aroused the greatest opposition was one requiring quarry excavations in which men are employed, as well as abandoned excavations, to be provided with railings. It was held that this would not only be impracticable in many cases, but would impose unnecessary financial burdens. It was explained that properties on which quarries are located usually have property line fences, and in addition have or may have warning signs, which are sufficient, except possibly right around the plant where workmen were continuously employed, where railings could be installed.

It was argued also that the requirement that each quarry must have a suitable first-aid outfit, stretcher, etc., was unnecessary, especially in the case of small quarries near villages or cities, or where one company has a chain of quarries a short distance apart. The commissioners seemed to feel, however, that it should stand, and it was not stricken out of the tentative code.

The committee which prepared the original draft of the code was composed of:

F. C. Wolf, Supt. Waukesha Lime & Stone Company, Waukesha; C. S. Richter, Gen. Mgr., Montello Granite Company, Montello; R. W. Scherer, Western Lime & Cement Company, Milwaukee; William Wiske, Wisconsin Granite Company, Red Granite; William Stoeckman, General Refractories Company, Ableman; John Stewart, Wisconsin State Federation of Labor, Red Granite; A. H. Findeisen, Industrial Commission, Madison.

The important sections of the draft, which has not yet been made operative by the Industrial Commission, are as follows:

General Safety Precautions

(a) The operator and superintendent of every quarry shall use every reasonable precaution to insure the safety of the workmen in the quarry in all cases, whether provided for in these orders or not.

(b) All defects in or damage or injury to machinery or timbering or to apparatus and equipment generally in and about a quarry, all unsafe or dangerous conditions in any part of the quarry, and all accidents occurring in the course of quarrying operations, even though not resulting in personal injury, shall be promptly reported to the quarry foreman or superintendent by the person observing the same.

(c) Each workman employed in the quarry, when first engaged, shall have his attention directed to the general and special rules provided for in these orders, and if unable to read shall have them explained to him.

(d) No person shall, without authority of superintendent or foreman, han-

dle electric wires or conductors, or electrical apparatus of any kind.

Care of the Injured

(a) It shall be the duty of the operators, superintendents, or anyone in charge of any quarry, to keep at such place about the quarry as may be designated by the Industrial Commission, a stretcher, a woolen blanket, and waterproof blanket in good condition for use in carrying any person who may be injured at the quarry. At all quarries an adequate supply of materials shall be kept readily accessible for the treatment of anyone injured and shall include the following in suitable quantity: First-aid outfits consisting of one extra long gauze bandage with compress sewed in its center, one triangular bandage with methods of application printed thereon, two safety pins, and one card of instructions; large first-aid dressings for wounds; package of sterilized gauze; assorted bandages; United States Army tourniquet; carbolated vaseline or boric acid ointment; packages of absorbent cotton; safety pins; shears, tweezers, aromatic spirits of ammonia; paper cups; first-aid book of instructions; soap; basins; towels.

(b) It shall be the duty of the operator to have at least two employes at the quarry receive instructions from a competent person in the proper handling and treatment of injured persons before the arrival of a physician. These instructions should be received from time to time, not less than once in every six months.

Superintendents

(a) The operator of every quarry shall appoint a man who shall be personally in charge of the quarry and the performance of the work done therein, who shall be designated as the "superintendent," provided, however, that nothing herein contained shall prevent the owner or operator of any quarry from personally filling the office of superintendent.

(b) The superintendent of every quarry shall inspect or cause some competent person or persons appointed by him to inspect all quarrying appliances, boilers, engines, magazines, explosives, signalling devices, tracks, ladders, dry closets, and all parts and appliance of said quarry in actual use, and any such person or persons appointed by the said superintendent shall at once report any defects therein to the superintendent. It shall be the duty of the superintendent, upon ascertaining such defects to take immediate steps to remedy the same so as to make the same comply with the provisions of these orders, and he shall forthwith notify the operator of said quarry of the existance of such defects. It shall be the duty of the superintendent to appoint a competent man to have full charge, under the direction of said superintendent, of every magazine containing explosives situated on said quarrying property, and to make such other appointments and perform such other duties as are provided by these orders to be performed by such superintendent.

Inspection at the Face of the Quarry

(a) The superintendent of the quarry or a competent person detailed for this purpose shall make frequent inspections of the face of the quarry and overburden where men are employed and shall dislodge any slabs of rock or boulders in said face that may be dangerous to employes.

(b) Where necessary watchmen shall be employed at each face to warn the men in the quarry when loose rocks are about to fall.

(c) Sand and gravel pits shall be given a slope that will eliminate the danger of cave-ins, based upon the experience at said pits.

Elevated Spur Tracks

Elevated spur tracks shall be kept in good condition and a bumper or other means provided to prevent car rolling over the embankment. A proper runway for car men shall be provided.

Hoisting Apparatus and Derricks

(a) Wire rope slings, grabhooks or chains shall be used to attach the blocks of stone to the hoisting apparatus.

(b) All ropes, chains, cables, slings, sheaves, gears and other parts of derricks and hoisting apparatus in use shall be carefully examined frequently. Any parts that are found to be defective shall be renewed immediately.

(c) The wire rope guys supporting the mast of a derrick and their fastenings shall be inspected semi-monthly while in use and shall be kept in good condition.

(d) An approval signal system shall

be maintained when the hoists or derricks are so located that the operator cannot readily see or hear the signals given by men near the end of the hoists or derricks.

No person shall be hoisted out of or lowered into a quarry, or permitted to ride conveyor or elevator belts.

Explosives

(a) The daily supply of explosives in a quarry shall be kept in a stout, tight box with hinged lids and not more than 200 pounds of explosives shall at any time be kept or stored therein, and, except when necessarily opened for use by authorized persons, shall at all times be kept securely locked. Upon each such magazine there shall at all times be kept conspicuously posted a sign with the words "EXPLOSIVES" "DANGEROUS" legibly printed thereon.

(b) All explosives except detonators in excess of the daily supply authorized to be taken into or stored in the quarry shall be kept or stored in an approved magazine. All magazines shall unless otherwise authorized by the Commission, be located and constructed as follows: It shall be placed not less than 300 feet distant from any other structure or public highway. It shall be constructed of bullet-proof and fire resistant material and shall have no opening except for ventilation and entrance. Doors of such magazine must be fire resistant and bullet-proof and at all times kept closed and securely locked, except when it has to be entered by the person or persons in charge thereof.

Upon each side of such magazine there shall at all times be kept conspicuously posted a sign with the words "EXPLOSIVES" "DANGEROUS" legibly printed.

Magazines shall be ventilated, and the openings for ventilation shall be so screened that sparks of fire may not enter therein.

Magazines shall at all times be kept clean and dry.

Magazines shall be in charge of a person especially appointed for the purpose who shall have in his possession the keys of the magazine, and shall be responsible for the safe storage of explosives contained therein.

(c) All electric wires in any magazine or thraw house shall be protected by fuses and inclosed in a grounded conduit and shall not be brought within 5 feet of the explosives stored therein. The light shall be protected with guards.

(d) No naked light shall be introduced into a magazine where powder, explosives or inflammable substance are stored.

Smoking shall not be permitted in a powder magazine at a powder distributing station, or while handling powder.

(e) When supplies of explosives or fuse are removed from a magazine those that have been longest in the magazine shall be taken first.

(f) Containers of explosives shall be removed to a safe distance from the magazine before being opened, and no such containers shall be opened with an iron or steel instrument.

Storage of Detonators, Crimpers, Capping of Fuses

(a) No detonators shall be taken into any magazine containing other explosives.

No detonator shall be stored within fifty feet of other explosives.

No detonator shall be transported with other explosives except when being carried to the face for immediate use.

(b) All primers shall be exploded within thirty-six hours after making.

(c) Detonators shall not be removed from original containers except as they are used for capping fuses.

(d) No fuses shall be capped with detonators in any magazine or in any other place where detonators or other explosives are stored, but special benches shall be provided at a safe distance from such storage, place, where all fuses shall be capped.

(e) Only a crimper shall be used for attaching juse to blasting cap. The quarry operator shall furnish and keep inaccessible places, ready for use, crimpers in good repair. Broad jaw crimpers shall be used.

Tamping Bars and Powder Punches

All tamping bars and powder punches shall be of wood or non-sparking metal.

Blasting

(a) Bossess and shot firers about to fire shots, shall cause warnings to be given in every direction, and all

entrances to the place or places where charges are to be fired shall be guarded so far as possible.

(b) When firing by electricity from power or lighting wires in any quarry, a proper switch shall be furnished with lever down when "off." The switch shall be fixed in a locked box or room to which no person shall have access except the blaster. The lead wires shall be furnished with plugs and shall not be connected with the switch till ready to fire. After blasting, the switch lever shall be pulled out, the wires disconnected, and the box locked before any person shall be allowed to return, and shall remain so locked until again ready to blast.

(c) Special precautions shall be taken against shot firing cables or wires coming into contact with lighting, power or other circuits or with any metal pipe lines. A portable device for generating or supplying electricity for shot firing shall be in charge of a boss or shot firer. No person other than a boss or shot firer shall connect the firing machine or battery to the shot firing leader and such connection shall not be made until all other steps preparatory to the firing of a shot shall have been completed and the men removed to a safe distance.

(d) Suitable and convenient shelters shall be provided for the shot firers.

Hoisted Material

Hoisted material, or any loose material about the quarry shall be deposited not less than ten feet from the edge of the excavation and secured in such a manner that there is no possibility of the material falling back into the pit where men are employed.

Trimming Loose Scale

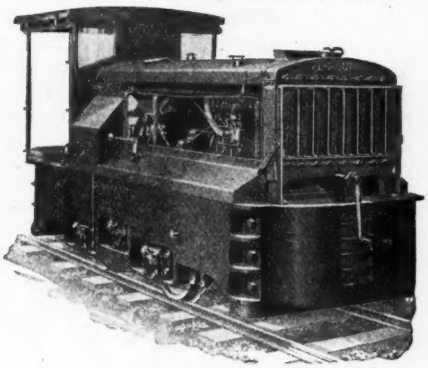
Persons engaged in trimming down loose scale and loose rock from high and steeply inclined ledges shall be provided with safety ropes. One end of the rope must be attached to the body continually and the opposite end firmly secured on the bank.

Quarry Stairs and Ladders

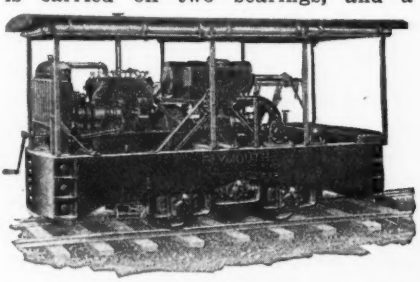
(a) Safe and easy access to quarry excavations shall be provided for deep quarries, stairs with numerous landings and secure handrails shall be provided.

New Industrial Gasoline Locomotive

A new industrial gasoline locomotive has been brought out by the Fate-Root-Heath Co., Plymouth, O. This new locomotive is known as Model CL, 3½-ton, and will be furnished in the two types illustrated. Type 2 has a cab with drop curtains for enclosure during inclement weather, with hood covering engine and transmission. Type 3 has a canopy with drop curtains for complete enclosure. With curtains rolled it is adapted for open season work or warm climates, and allows driver unobstructed vision in all directions. Both types are equipped with powerful, heavy duty Buda engine, extra large radiator with Moline sectional cores, and protected by heavy steel guard. The drive shaft is carried on two bearings, and a double width chain on main drive insures not only an extra margin of strength but minimizes link breakage. The frame is extra heavy with low hanging bumpers, thus according protection to chain and sprockets in case of track obstructions or derailment.



Type 2



Type 3

ASSOCIATION ACTIVITIES

Bids From Four Cities

One of Them Likely to Get Sand and Gravel Convention Next Month

FOUR widely operated cities—Chicago, Cincinnati, New Orleans and St. Louis— are prominently mentioned as the meeting place for the next convention of the National Association of Sand and Gravel Producers.

A postal card ballot has been sent out to the members from the office in Washington, asking the members to express their preference. The date for the convention has been tentatively set for January 24 to 26.

Stone Convention

National Association to Meet Same Time as Road Congress in Chicago

The National Crushed Stone Association will meet in Chicago, January 16 to 20, the time being chosen to correspond with that of the Road Congress.

Secretary A. P. Sandles states that quarrymen in all parts of the country have indicated their desire to have their convention at this time and place.

He says also that his correspondence indicates great interest and a larger attendance than has ever been had.

The St. Anthony Sand Stone Quarries, Inc., 133 West Washington Street, Chicago, Ill., has been incorporated with a capital of $50,000, to operate sand stone and other properties. The incorporators are John H. and Fred D. Ryan.

Road Builders to Meet

Annual Congress and Show Will Be Held in January at Chicago

EXTENDED discussion by noted highway engineers from all parts of the United States and Canada relative to design, methods and materials used in modern highway construction will form a large part of the program of the American Good Roads Congress, to be held at the Coliseum, Chicago, Ill., on January 17-20, next, under the auspices of the American Road Builders' Association.

Invitations to the Congress are being sent to nearly 30,000 Federal, state, county and city officials, contractors, engineers and business men in the United States and Canada. It is expected that the attendance will greatly surpass the record set last year and that the Congress will develop a clearer understanding of diverse highway problems, so road officials may, in spending their funds, secure "more roads for less money."

No less important will be the National Good Roads Show to be held at the Coliseum in conjunction with the Congress. This show will contain close to $1,500,000 worth of labor-saving road machinery appliances and materials and highway transport equipment. At the first drawing for exhibition space the entire 40,000 square feet of available space in the Coliseum and Annex was taken, necessitating the lease of additional buildings to care for the manufacturers now applying for room.

The Uvalde Rock Asphalt Co., San Antonio, Tex., is planning for the rebuilding of the portion of its works, recently destroyed by fire.

Lower Rates Demanded

Sand and Gravel Producers Appear Before Central Freight Association

REDUCTIONS in freight rates in the territory of the Central Freight Association were asked for, by representative aggregate producers, in a hearing before the traffic committee of the Association in Chicago, November 10th.

A meeting of the producers in the territory, called by the officers of the National Association of Sand and Gravel Producers, was held the previous day in Chicago to give a thorough discussion of the situation and map out a course of procedure in presenting the case to the committee.

A committee, with Mr. B. H. Atwood of Chicago as chairman, was appointed to outline the plan of presentation and choose the speakers to appear before the traffic committee.

President V. O. Johnston and Business Manager E. Guy Sutton of the National Association of Sand and Gravel Producers, also laid before the meeting of producers the complaints which are being brought by the association before the Interstate Commerce Commission, relative to the excessive rates in the various freight districts. The attorney who drew up the complaint, John S. Burchmore, of Chicago, also explained the course of action in considerable detail, and the entire plan will go forward with the endorsement of producers in the territory represented by those present at the meeting.

Mr. A. W. Dann of Pittsburgh, opened up the case for the producers before the hearing of the traffic committee, although he said the hearing was somewhat in the nature of a post-mortem, as the authorities had already made a slight reduction of rates to take effect November 15th. He pointed out, however, that the new rates were 115 per cent of the rates in effect prior to the issuance of the famous order Ex Parte 74, making a reduction of only 18 per cent, while other commodities have been reduced as high as 39 per cent. He laid great emphasis on the fact that the railroads are losing business by high freight rates on building materials, not only because of the restrictions in building caused thereby, but because of the fact that other methods of delivery are being adopted wherever possible. He stated that in the case of his own company, 44 per cent of their production during the past year has been moved by either water or motor truck. Last year the tonnage so moved was almost negligible.

Mr. Dann propounded to the committee two pertinent questions: First, why should sand and gravel pay more than other commodities, all of which have a higher value and most of them bringing a greater hazard to the carrier? Second, why should sand and gravel pay a higher rate than a competing commodity such as slag?

The second speaker was Mr. Carroll of Buffalo, who was in a peculiarly good postion to know the influence of freight rates on the industry, because of the fact that in New York the 40 per cent increase ordered by Ex Parte 74 does not apply, while across the line in Pennsylvania it does apply. Consequently western New York producers, who in normal times furnish large quantities of material to Pennsylvania, are doing little business in that direction.

Mr. Howard Hoel, of the Greenville Gravel Co., Greenville, Ohio, stated that because of the fact that his state had been able to get out from under the 40 per cent increase of Ex Parte 74, the State Highway Commission is now preparing to let in January, $15,000,000 of road work in one letting, the

largest amount that it has ever given out at one time. He gave figures to show how freight is being lost to the railroads, not only because high rates cut production, but because they encourage delivery by motor truck.

Mr. M. A. Neville, president of the Indiana Sand and Gravel Producers Association, said that careful computation shows that the decrease in freight rates so far granted in his state amount to only 4.6 per cent from figures on actual shipments.

Mr. Bolender, of the Michigan Association, talked particularly about the now famous "Michigan scale," which he says, according to the tabulation of experience of twelve representative producers, shows a reduction of only 6.5 per cent. He secured data from many more producers, but a large number of them were shipping almost entirely by truck and could not give very much of value regarding freight shipments. He also said that he could practically assure the committee that the Michigan scale was not satisfactory to the Michigan railroad commission and would be repealed.

Pres. V. O. Johnston summed up the case for the operators in a brief and forcible presentation. He made a plea for co-operation between the producers and the railroads, saying that the business had been built up in that way, and could only be perpetuated in the same manner.

"One more year like 1921 and it will be too late," said Mr. Johnston, and intimated that such business as the producers were able to get would by necessity go to other carriers. In commenting upon the plea of the railroads that the cost of operation made high rates necessary, he said that "paper" rates were not bringing the railroads any money, that only such rates as would move tonnage would be of any value.

A few questions were asked by the members of the committee, especially what kind of a rate would be acceptable to the producers. It was stated by some of the speakers that it could not be determined accurately, but it was a matter of "cut and try," and that the rates must be such in each locality as to move the tonnage. Getting down, however, to actual figures, Mr. Atwood stated that the least the producers would be satisfied with would be to strike out entirely the 40 per cent increase ordered by Ex Parte 74 and cut 10 per cent off the 20 cents a ton raise made to apply in order No. 28. This the producers had agreed upon the previous day as the only rate with which they could expect to do a satisfactory business and. President Johnston told the traffic committee very plainly that the producers did not expect to rest their case until this reduction was secured.

Charts on Soil Liming

First of Series Prepared by National Lime Association

As a phase of its educational work, the National Lime Association is now issuing sets of charts dealing with the various phases of soil liming. The first installment of these charts is now ready for distribution to agricultural workers.

The five charts now available deal with the need of United States soils for lime, monetary returns from liming, comparative strength, purchase of soil limes, and lime, hay, and livestock. Later charts will extend these subjects.

Each chart is accompanied by a brief explanation that may serve as the basis of part of a lecture.

The charts are on paper 3x2 feet in size. When complete, a set will consist of about 12 charts.

Cement Makers to Meet

Annual Meeting to Be Held in New York City This Month

THE annual meeting of the Portland Cement Association will be held in New York, December 12, 13, and 14. The sessions will be held at the Biltmore Hotel, also the banquet on the evening of the 14th.

This is the regular meeting for the election of officers, and for receiving reports from the various standing committees, so that the program promises to be a full one. A good attendance from all parts of the country is anticipated.

Sets Convention Date

Indiana Sand and Gravel Association Will Meet January 10 and 11

AT a meeting of the Indiana Sand and Gravel Producers Association, held in Chicago, November 9, previous to the freight rate hearing, the date for the next annual convention was set for January 10th and 11th, 1922. The president appointed a program committee, consisting of Mr. J. A. Shearer, chairman, and Mr. L. R. Witty and Mr. H. E. Neal.

A general discussion of the policy and aims of the Association for the remainder of the year developed the sentiment that in addition to continuing efforts for freight rate reductions, public officials should be induced to continue public works and road building on the basis of the benefits to be derived by the general public.

On account of the great increase in transportation of sand and gravel by truck as compared with former years, and because of the service in regard to quality of materials and specifications rendered by the Association, it was thought that the membership dues of the trucking plants should be put on a tonnage assessment basis. A committee composed of Mr. Jas. P. Coyle, chairman, and Messrs. G. J. Hoffman, J. A. Shearer, J. W. Bedford and G. J. Nattkemper, was appointed to prepare recommendations for such assessment, to be presented at the annual convention.

Will Meet at Joplin

THERE will be a meeting of chats, and sand and gravel producers, held at Joplin, Mo., on December 9, at which President V. O. Johnston, Executive Secretary E. Guy Sutton, and Traffic Representative Edwin Brooker, of the National Association, will be present.

S. A. Fones of the Independent Gravel Company, Webb City, is arranging the details of this meeting.

Missouri Valley Meeting

THE annual meeting of the Missouri Valley Association of Sand and Gravel Producers will be held at Kansas City, on December 8.

During this meeting there will be a conference of shippers in this territory to consider the matter of freight rate reductions.

Iowa Rate Hearing

A RATE hearing will be held, December 6, before the Iowa Board of Railroad Commissioners, at Des Moines. The executive committee of the Iowa Sand and Gravel Producers' Association will appear, also the transportation committees of the Highway Service Bureau.

Directory of Cement Producers

Acme Cement Corp., Catskill, N. Y.
Advance Waterproof Cement Co., Chicago, Ill.
Aetna Portland Cement Co., Detroit, Mich.
Alamandares Portland Cement Co., Havana, Cuba.
Allentown Portland Cement Co., Allentown, Pa.
Alpha Portland Cement Co., Easton, Pa.
Alsen Cement Co. of Amer., Inc., New York, N. Y.
Altoona Cement Company, No. Altoona, Kan.
Ash Grove Lime & Portland Cement Co., Kansas City, Mo.
Atlas Portland Cement Co., New York, N. Y.
Bath Portland Cement Co., Philadelphia, Pa.
Beaver Portland Cement Co., Portland, Ore.
Bessemer Limestone & Cement Co., Youngstown, Ohio.
Bonner Portland Cement Co., Kansas City, Mo.
British Columbia Cement Co., Ltd., Victoria, B. C., Canada.
Burt Portland Cement Co., Bellevue, Mich.
California Portland Cement Co., Los Angeles, Cal.
Canada Cement Co., Ltd., Montreal, Quebec, Canada.
Cape Girardeau Portland Cement Co., Cape Girardeau, Mo.
Castalia Portland Cement Co., Pittsburgh, Pa.
Cayuga Operating Co., Inc., Portland Point, N. Y.
Cement Export Co., New York, N. Y.
Cement Securities Co., Denver, Colo.
Choctaw Portland Cement Works, Tulsa, Okla.
Clinchfield Portland Cement Corp., Kingsport, Tenn.
Colorado Portland Cement Co., Denver, Colo.
Continental Portland Cement Co., St. Louis, Mo.
Coosa Portland Cement Co., Ragland, Ala.
Coplay Cement Mfg. Co., Coplay, Pa.
Cowell Portland Cement Co., San Francisco, Cal.
Crescent Portland Cement Co., Wampum, Pa.
Cuban Portland Cement Corp., Havana, Cuba.
Cumberland Portland Cement Co., Cumberland, Md.
Davenport Cement Co., Davenport, Iowa.
Dewey Portland Cement Co., Kansas City, Mo.
Dexter Portland Cement Co., Nazareth, Pa.
Diamond Portland Cement Co., Cleveland, Ohio.
Dixie Portland Cement Co., Chattanooga, Tenn.
Edison Portland Cement Co., W. Orange, N. J.
Edmonton Cement Co., Ltd., Alberta, Canada.
Federal Portland Cement Co., Ft. Dodge, Iowa.
Ft. Scott Hydraulic Cement Co., Ft. Scott, Kan.
Fredonia Portland Cement Co., Fredonia, Kan.
Georgia Cement & Stone Co., Atlanta, Ga.
Giant Portland Cement Co., Philadelphia, Pa.
Gilmore Portland Cement Co., Gilmore City, Iowa.
Glens Falls Portland Cement Co., Glens Falls, N. Y.
Golden State Portland Cement Co., Los Angeles, Cal.
Great Western Portland Cement Co., Kansas City, Mo.
Gulf States Portland ement Co., Demopolis, Ala.
Hanover Portland Cement Co., Ontario, Canada.
Hawkeye Portland Cement Co., Des Moines, Iowa.
Helderberg Cement Co., Albany, N. Y.
Hercules Cement Corp., Philadelphia, Pa.
Huron Portland Cement Co., Detroit, Mich.
Indiana Portland Cement Co., Greencastle, Ind.
Inland Portland Cement Co., Spokane, Wash.
International Cement Corp., New York, N. Y.
International Portland Cement Co., Spokane, Wash.
Inter-States Portland Cement Co., Des Moines, Iowa.
Ironton Portland Cement Co., Ironton, Ohio.
Kirkfield Portland Cement Co., Toronto, Ontario, Canada.
Knickerbocker Portland Cement Co., New York, N. Y.
Kosmos Portland Cement Co., Kosmosdale, Ky.
LaSalle Cement Co., Chicago, Ill.
La Tolteca cia de Cemento Portland S. A., Mexico City, Mexico.
Lawrence Portland Cement Co., Northampton, Pa.
Lehigh Portland Cement Co., Allentown, Pa.
Louisville Cement Co., Louisville, Ky.
Marquette Cement Mfg. Co., Chicago, Ill.
Meramac Portland Cement & Material Co., St. Louis, Mo.
Michigan Portland Cement Co., Chelsea, Mich.
Missouri Portland Cement Co., St. Louis, Mo.
Monarch Cement Co., Humboldt, Kan.
Monolith Cement Plant (succeeded by U. S. Potash Co.), Los Angeles, Cal.
National Cement Co., Ltd., Ontario, Canada.
Nazareth Cement Co., Nazareth, Pa.
Nebraska Cement Co., Denver, Colo.
Neewaygo Portland Cement Co., Neewaygo, Mich.
New Egyptian Portland Cement Co., Fenton, Mich.
New England Portland Cement Co., Rockland, Maine.
N. Y. & New England Cement & Lime Co., New York, N. Y.
Northwestern States Portland Cement Co., Mason City, Iowa.
Ogden Portland Cement Co., Ogden, Utah.
Oklahoma Portland Cement Co., Denver, Colo.
Old Mission Portland Cement Co., San Francisco, Cal.

Olympic Portland Cement Co., Ltd., Seattle, Wash.
Ontario Cement Co., Ltd., Ontario, Canada.
Oregon Portland Cement Co., Portland, Ore.
Pacific Portland Cement Co., San Francisco, Cal.
Peerless Portland Cement Co., Union City, Mich.
Peninsular Portland Cement Co., Cement City, Mich.
Penn-Allen Cement Co., Allentown, Pa.
Pennsylvania Cement Co., New York, N. Y.
Petoskey Portland Cement Co., Petoskey, Mich.
Phoenix Portland Cement Co., Philadelphia, Pa.
Portland Cement Co. of Utah, Salt Lake City, Utah.
Pyramid Portland Cement Co., Des Moines, Iowa.
Red Star Cement Co., La Salle, Ill.
Riverside Portland Cement Co., Riverside, Cal.
Rizal Portland Cement Co., Philippine Islands.
St. Mary's Cement Co., Ltd., E. Toronto, Ont., Can.
San Antonia Portland Cement Co., San Antonia, Texas.
Sandusky Cement Co., Cleveland, Ohio.
Santa Cruz Portland Cement Co., San Francisco, Cal.
Security Cement & Lime Co., Hagerstown, Md.
Signal Mountain Portland Cement Co., Chattanooga, Tenn.
A. J. Snyder & Co., Rosendale, N. Y.
So. States Portland Cement Co., Rockmart, Ga.
Southwestern Portland Cement Co., El Paso, Texas.
Standard Portland Cement Co., New York, N. Y.
Standard Portland Cement Corp., San Francisco, Cal.
Superior Portland Cement Co., Seattle, Wash.
Texas Portland Cement Co., Dallas, Texas.
Three Forks Portland Cement Co., Denver, Colo.
Tidewater Portland Cement Co., Baltimore, Md.
Trinity Portland Cement Co., Dallas, Texas.
Tulsa Portland Cement Corp., Tulsa, Okla.
Union Portland Cement Co., Ogden, Utah.
United Portland Cement Co., Ltd., Ontario, Canada.
U. S. Portland Cement Co., Denver, Colo.
United States Potash Co., Los Angeles, Cal.
Universal Portland Cement Co., Chicago, Ill.
Utica Hydraulic Cement Co., Utica, Ill.
Utah Sales Co., Ogden, Utah.
Vulcanite Portland Cement Co., Philadelphia, Pa.
Wabash Portland Cement Co., Detroit, Mich.
Wellston Iron Furnace Co., Jackson, Ohio.
Western States Portland Cement Co., Independence, Kan.
Whitehall Cement Mfg. Co., Philadelphia, Pa.
Whiterock Quarries, Bellefonte, Pa.
Wolverine Portland Cement Co., Coldwater, Mich.
Wyandotte Portland Cement Co., Detroit, Mich.

Foreign Cement Plants

SPAIN

Cementos Portland de Lemans (S. A.), Campa de Altra, 2, Bilbao.
Cementos Portland Hispania, Tellez, 6, Madrid.
Cia. Anglo-Espanola de Cementos Portland, Gran Via, 21-23, Madrid.
Cia. General de Asfaltos y Portland Asland, Palacio, 15, Barcelona.
Comp. Segoviana de Cementos Portland, Segovia.
S. A. Portland Iberia, Fernanflor, 2, Madrid.
Sdad. Espanola Cementos Portland, Gran Via, 22, Madrid.
Soc. An. Tudela-Veguin, Oviedo.
Sociedad General de Cemento Portland, Bailen, 9, Bilbao.

GERMANY

Roman-Cement Fabrik Muhlbach, Furth, Bavaria.

BELGIUM

J. M. Dartois & Co., Calonne-lez-Antoing.
G. Houge, Rue d'Assant, Calonne-les-Antoing.
F. & P. Bataille & Cie (Gaurain Ramecroix), Tournai.
E. Brees, Tournai.
Ciment Portland de l'Escant Ciedries (a Antoing), Tournai.
Iron Cement Works, Tournai.
J. & A. Leman, Tournai.
F. Sherrington & Co., Tournai.
M. Lemay, Tournai.
Soc. Anon, des Carrieres Dumon, Tournai.
Soc. Anon, des Carrieres, Fours-a-Chaux et Ciments de Tournaisis (at Gaurain-Ramecrois), Tournai.
S. A. des Carrieres Thorn (at Chercq), Tournai.
Soc. Anon, des Tours-a-Chaux et Ciments d'Allain at Allain-les-Tournai, Tournai.
Soc. Anon, des Pres. et de la Roquette (at Gaurain Ramecroix), Tournai.
Souffiet Leblond Ste., Tournai.
Alliance Portland Cement Works, Vaulx-Les-Tournai.
Ciments Portland Vaulx & Antoing Cie. des, Vaulx-Les-Tournai.
Compass Portland Cement Works (Bara Vion), Vaulx-Les-Tournai.
Debaosoeix et Lemay, Vaulx-Les-Tournai.
Duthoit F. Lefebvre, Lemay M., Vaulx-Les-Tournai.
Lenain J. B. (office at Antoing), Vaulx-Les-Tournai.
Ste. Anon, des Ciments Portland du Tournaisis, Vaulx-Les-Tournai.
Ste. An. des Produits Calcaires due Tournaisis, An. Duquesne & Co., Vaulx-Les-Tournai.
The Antwerp Portland Cement Works (office at Antwerp), Vaulx-Les-Tournai.

ITALY

Saponara Giovanni, Monopoli.
Societa Anonima Cemente e Affini, Monopoli.
Zunnine Francesco, Monopoli.

CZECHO-SLOVAKIA

Barta & Tichy (at Radotin), Zbraslav.
Merwartove Bratri (at Radotin), Zbraslav.

ARGENTINA

Argentina Portland Cement Co., Reconquista 46, Buenos Aires.

URUGUAY

Uruguay Portland Cement Co., Calle Piedras 387, Uruguay, Montivideo.

No Decline in Trade

Eastern Business Maintains Good Level—News Notes of Many Producers

By Our Eastern Correspondent

The trend of business in the sand, gravel and crushed stone industries at New York and vicinity continues encouraging. The anticipated decline in trade always looked for at this time of year has not yet made its appearance, and as long as the present open mild weather maintains it is quite certain that sizeable distribution will go on. Large building work is making large demands on the supply market in this district, and both the Brooklyn and Bronx sections are drawing heavy on the sand, gravel and affiliated material market for residential operations.

Prices are holding well at recently established levels and producers incline to the opinion that current figures will prevail well through the winter season. Further changes, if any, are likely to be fractional and not of material moment. With present labor and production costs, existing quotations in a number of instances are practically "rock bottom" and additional declines would tend towards curtailed outputs.

Crushed stone is selling in the wholesale market from $1.80 to $1.90, both 1½ and ¾-inch sizes, in carload lots, f. o. b. city. A year ago, this material was quoted at $2.00 and $2.15, respectively, for the sizes noted. Local dealers are maintaining a price of $4.00, delivered. The supply on hand is good, and sufficient for all current demands.

Gravel, 1½ and ¾-inch stocks, holds at $2.00 a cubic yard, in cargo lots, wholesale; established in the recent decline, as noted in PIT AND QUARRY. Retail, the material is priced at $3.00 to $3.25, according to selection, high-grade washed gravel bringing the latter figures. Building sand, wholesale, is firm at $1.25 a cubic yard, as compared with $1.50 a year ago this time. New York dealers are asking $1.80 and $1.85, delivered on the job. Selected white sand holds at $5.00 a cubic yard, retail.

Portland cement is enjoying a fair market, with competition among the dealers extremely keen for busines The material is priced at $2.90 a barrel, delivered, with established bag rebate of 10 cents. The price to dealers, at the yards, has declined from $2.50 to $2.40, while alongside dock a figure of $2.10 maintains. As an idea of the price change of cement in the New York market during the past year, it is interesting to note that in December, 1920, it was selling wholesale at $4.10 a barrel.

Common lime in standard 300-pound barrels is quoted at $4.40 at the different supply yards. Finishing lime in the same sized container is priced at $4.70. Hydrate finishing lime in paper holds at $24.00 a ton, retail, while the warehouse price to dealers stands at $17.00 Hydrate common, in cloth is selling at $22.50, delivered on the job.

The Pittsfield Lime & Stone Co., Pittsfield, Mass., is completing plans for enlargements at its plant in the Richmond Summit district. Four new kilns will be constructed, and alterations and improvements made in present kilns. Other departments will be extended. The work will be placed under way at an early date.

The Connecticut Adamant Plaster Co., New Haven, Conn., has filed notice of increase in capital from $56,000 to $300,000 for proposed expansion.

Alexander Falconer, Quincy, Mass., is maintaining active production at his quarry on Packard's Lane. Large shipments are being made from the plant.

Sand, gravel and kindred materials are operating under a fair demand at Buffalo, N. Y., and vicinity. The Buffalo Gravel Corporation and other leading organizations in the line are maintaining good production. Gravel is priced at around $2.75 delivered, while sand is selling for $2.40 and $2.50 a cubic yard.

The Morristown Cement Rock Co., 115 Speedwell Avenue, Morristown, N. J., has been formed under state laws with a capital of $100,000, to operate rock properties in this section. Extensive activities are planned. The company is headed by Harvey A. Elder and Elmer Snook.

The Reconstruction Stone & Building Co., Little Falls, N. J., recently organized, has acquired property on Pompton Avenue, Cedar Grove, near Little Falls, heretofore held by George

Canfield, and proposes extensive operations at this location for the production of stone and other building products. H. Edgar Mason is president; Joseph L. Bahr, Verona, N. J., treasurer; and Harry L. Hammond, Mountainview, N. J., secretary.

The Philadelphia, Pa., market is showing demand for foundry sand and gravel, and a number of plants are stocking up for winter requirements in this line. Prices have declined about 20 per cent recently. There is also a good call for gravel for macadam road work in this section.

The Susquehanna Stone Co., Dalmatia, Pa., is planning for the rebuilding of its crushing plant, destroyed by fire recently, with loss estimated at about $12,000. The plant has been giving employment to about 50 men.

Stone quarries at Lewistown, Pa., are feeling the revival of operations in the steel industry, and practically all of the large plants in this district are producing at a high rate. The Naginey Stone Quarry Co., a subsidiary of the Cambria Steel Co., is working on a full time basis.

The Wernersville Lime Co., Wernersville, Pa., has been organized under state laws with capital of $25,000, to manufacture lime and affiliated products. David W. Rubright, Reading, Pa., is treasurer.

The Templeton Limestone Co., Kittaning, Pa., has work under way on the rebuilding of its crushing plant, recently destroyed by fire. The new crusher house will be 30x60 ft., and with power house, 25x25 ft., is estimated to cost about $50,000. W. L. Snyder is superintendent.

The Stonecrete Corporation, 6023 Penn Avenue, Pittsburgh, Pa., has acquired property at Cheswick, Pa., fronting on the Allegheny River, for the erection of a new plant for the manufacture of special stone and cement products. The initial works will be two-story, estimated to cost in excess of $25,000. A waterway will be dug to a depth of about 8 feet, to permit barges of sand and gravel to be unloaded at the site. Charles B. Lawton heads the company.

The River Sand & Supply Co., Pittsburgh, Pa., is being organized by H. E. Finney, James McAllister and B. H. Thompson, to operate a local sand and gravel business. The company will mine the material in the river district and establish a barge line to the city. It is represented by Benjamin H. Thompson, 1209 First National Bank Building, Pittsburgh.

The Rodgers Sand Co., Pittsburgh, Pa., is operating its entire fleet of eight boats at the present time, and reports a good demand for material in the local market. A day and night shift of workers is being maintained to handle the call for building service and road work. The company is concentrating operations at its property, known as Fourteen-Mile Island in the Allegheny River, where dredging is being carried to a point of about 30 feet below pool level. Prices of sand and gravel are said to be about 25 to 30 per cent below the figures of a year ago. Captain W. B. Rodgers heads the company.

Indiana System Praised

Ohio Visitors Think It Could Be Adopted to Good Advantage in Their Own State

By Our Indianapolis Correspondent

Lawrence Lyons, director of the state highway department, recently received a letter from Senator Charles Brand, of Urbana, Ohio, who with a party recently toured Indiana to obtain information on what Indiana is doing in road building and in the maintenance line, and as a result of the trip states that Indiana has a much more complete system of state roads than Ohio, and spends less money in highway improvement and construction than Ohio. Senator Brand observed also that the work of the state highway commission has a very beneficial effect on the efforts of local officials to improve conditions on the county or secondary roads.

The use of native material, gravel and stone for practically all the roads rather than expensive concrete and brick, has given Indiana one of the best systems of public roads, according to Senator Brand. He says Ohio refuses to use her native materials in her state system and as a result the entire income of their state highway department is about exhausted and many of their state roads are unimproved and neglected in order that property owners along these roads might be forced to put down hard-surfaced roads, regardless of cost. The

decision to build gravel and stone roads on many sections of the Indiana state highway system was made by Governor Warren T. McCray, who wished to avoid in this state the difficulties complained of in Ohio, and to give Indiana the best roads possible at the least cost.

The Dark Hollow quarry and mill of the George Doyle Stone Company recently turned out the largest one-piece stone columns ever produced in the Indiana stone district. Thirty-six of these columns are to be shipped to Harrisburg, Pa., to be used in the construction of the new Pennsylvania Statehouse. A special derrick was built for swinging the blocks, which are 33.8 feet long by 4.10 feet square, to a lathe, built especially for turning these columns.

A. E. Dickinson, J. E. Rowe and W. R. Martin have organized a new company, to be known as The Imperial Stone Company, at Bedford, Indiana. The company has been incorporated under Indiana laws and has a capital stock of $150,000.

William C. Cartwright, 67 years old, died recently at his residence in Indianapolis, of pneumonia, following an illness of five weeks. Mr. Cartwright had been in ill health since last spring, but had been actively engaged in his business until five weeks ago. He lived at Portland, Ind., until ten years ago, when he moved to Indianapolis. He was secretary-treasurer of the Midwest Crushed Stone Quarries. He was an active member of the Broadway Methodist Church and was interested in the work of the Gideon lodge. He is survived by his widow and three sons, Forest and W. Dale of Indianapolis and Lawrence R. of Portland.

The Champion Gravel Company has been organized at Iron Mountain, Mich., with a capital stock of $200,000. The officers are P. B. Spear of Marquette, president and manager; M. J. Bacco of Iron Mountain, vice-president; F. B. Spear, Jr., of Marquette, secretary and treasurer. The new company has taken over the plant of the Champion Sand and Gravel Company at Champion, and also have, nearing completion, a plant at Hamilton Lake. The construction of a new plant at Pound, Wis., will be started this fall.

From Cement Districts

News Notes Among Producers in Various Parts of the Country

Lehigh Valley District

Cement shipments are holding at a good point from the different mills in the Lehigh Valley district, and cars are being loaded as fast as received. This condition is expected to prevail for a number of weeks, absorbing considerable stocks on hand for immediate distribution. A noticeable shortage of cars is being evidenced, and as generally expected at this time of the year, although not causing any serious delays up to the present.

The mills are commencing to curtail production, particularly in the vicinity of Coplay and Northampton, and another month is likely to see a number of plants practically idle. With such a condition, labor is very plentiful and growing more so, and mills can readily secure all the men desired.

The Atlas Portland Cement Co. has closed down its No. 2 Mill at Northampton, throwing a number of men out of work. Shipments which have been quite heavy from this plant are being reduced. The company is also reported to be planning for further curtailment during the winter period.

The Coplay Cement Co. has been setting off some heavy blasts at its quarries in the Coplay section. Ten holes, bored to 20 ft. from the face of No. 3 Quarry, at a distance of about 15 feet apart, filled with a charge of 15,000 pounds of dynamite, were set off early in November, giving several thousand tons of rock at the quarry surface. Another blast at the same quarry later in the month, produced an estimated amount of about 75,000 tons of cement rock for plant service, or about 2 months supply under normal production. This charge totaled 15 holes, 145 feet in depth, each about 20 feet apart, with 25,000 pounds of dynamite. The available rock is now said to be sufficient for about five months operation at the mills on the present production basis.

The Coplay company is using its Mill C at good capacity, and no immediate further curtailment is anticipated. A group of students from a

New York technical school made a sight-seeing visit to the plant recently.

The Cement Medical Association, composed of physicians practicing at Northampton, Coplay, Cementon and Egypt, was re-organized at a meeting at the Allen Hotel, Northampton, November 9. The organization has developed plans to work in close cooperation with the different cement companies. Dr. H. Y. Horn, Coplay, was elected president of the association.

New York

The International Cement Co., Hudson, N. Y., has broken ground for the erection of a new one-story storehouse at its local mill, to be 160x600 feet, and estimated to cost about $200,000. The Turner Construction Co., 244 Madison Avenue, New York, has the building contract.

The Hudson Valley Portland Cement Co., New York, has been organized under state laws with a capital of $100,000, to operate a cement mill in the Hudson River cement district. The company is headed by H. W. Davey, M. S. Reeve and E. F. Mack, Jr. It is represented by Hyman Dominitz, 152 West Forty-second Street.

James J. Coll, chief engineer at the mill of the Atlas Portland Cement Co., Hudson, N. Y., recently spent a two-weeks' vacation with his family at Coplay, Pa.

New Jersey

The Edison Portland Cement Co., New Village, N. J., made a reduction of 5 cents an hour in wages at its mills, effective November 16. This is the fourth such reduction placed in effect this year, with an aggregate wage cut of 20 cents an hour. About 450 men are affected, the majority of whom work on a 10-hour day schedule. Men on the night shift at the mill are working on a 12-hour basis. Common labor at the plant has been reduced to 25 cents an hour. The company is maintaining production on a fair basis, and no immediate curtailment has been announced.

The Eagle Cement Corporation, Jersey City, N. J., has been organized under state laws with a capital of $110,000, to manufacture cement. The company is represented by the United States Corporation Co., 15 Exchange Place.

Other Districts

The National Portland Cement Co., 516 Book Building, Detroit, Mich., will hold in temporary abeyance the erection of its proposed new cement plant on Coldwater Lake, Mount Pleasant, Mich. Plans are being drawn and it is likely that bids will be asked early in the coming spring. The plant will be two-story and is estimated to cost close to $500,000. H. C. Shields is manager.

The Carney Cement Co., Carney Station, Mankato, Minn., is completing foundation work for the erection of a number of new buildings at its local plant, and will defer the completion of plans for the superstructures until a later date, or until conditions in the industry warrant the expansion. A total of eight new buildings is projected. R. K. Meade & Co., 13 East Fayette Street, Baltimore, Md., are engineers. H. E. Carney is president.

The South Western Portland Cement Co., El Paso, Tex., has preliminary surveys under way for the erection of its new mill on property recently acquired in the vicinity of Waco, Tex. The plant will consist of a number of buildings and is estimated to cost in excess of $2,000,000, including machinery.

J. A. Wheeler, vice-president of the Texas Portland Cement Company, Dallas, Tex., states: "During the summer, we made a complete change in our kiln department, installing three 9x8x220 foot kilns in place of the four 8x125 foot kilns previously in use. We have also had one new drier, one kominutor and one tube mill installed, and our capacity has been increased from 2,400 barrels per day to about 3,500."

The Las Vegas Sand and Gravel Company has been incorporated with offices at Las Vegas, New Mexico, C. Iden, agent. The company will excavate and prepare silex, sand, gravel and crushed rock, and is capitalized at $25,000. The incorporators are: E. T. Springer, Cimarron; James Collier, Denver; C. Iden, East Las Vegas, and C. Rosenwald, East Las Vegas.

The Iowa Gravel Company has filed articles of incorporation, listing capital stock at $150,000. President, E. H. Hoyt; vice-president, Scott M. Ladd; secretary, Paul Graham, treasurer, H. L. Adams.

Early Plans on Big Road Program

Outlook Most Favorable For Several Years—7,000 Miles Scheduled

By Our Washington Correspondent

More than $150,000,000 will be expended for road construction during the next few months as a result of joint contributions by State and Federal governments, according to officials of the Federal Roads Bureau. With a nation-wide surplus of labor and falling prices for materials, road building will take on a new and record impetus, officials say. Contractors are at work in virtually every State preparing bids for work projected. Money is now available for the construction and repair of more than 7,000 miles of highway.

Campaigns to stir public officials to the necessity of undertaking road work now and next spring are being made in many localities by chambers of commerce, automobile associations, farmers' organizations, and civic groups. Highway construction undertaken now is in line, it is pointed out, with the recommendation of the National conference on unemployment, which urged the building of as many miles now as possible to afford work for the jobless.

The recent passage of the Federal Highway Act by Congress, appropriating a fund of $75,000,000 to be apportioned among the states taking advantage of the 90 day period, means that work soon will be undertaken in about 30 states. The appropriation of this money means the expenditure of twice the amount because the money will be made available only where the State and local governments appropriate like sums.

Road building costs now are cheaper than at any time since 1914. The average cost of highway construction in the United States last year was $21,000 a mile. For some varieties of roads, the cost was $40,000. This, however, represents a decline of about 20 per cent from the maximum for 1920. More than 27,000 miles of new highway have been constructed in the United States in the last three years as a result of the last appropriation for this work by the Federal government. The appropriation was $266,000,000. It was made in 1916, but little work was done until 1918. Approximately $100,000,000 worth of road contracts were let this year, providing for the construction of nearly 5,000 miles. Many states had been awaiting the passage of this bill, before launching on their highway programs. Immediate building is expected to start in many quarters with consequent improvement in employment conditions.

Senator Charles E. Townsend had been leading the campaign for the passage of this act which incorporates most of the principles for which he has been fighting. Primarily it demands that a portion of the Government funds be set aside for upkeep, so that the original investment will not be allowed to deteriorate. Provision also is made for allocating a percentage of the funds for interstate highways. Special appropriations are made for forest roads and trials.

The law recently enacted, while providing that Federal money shall be expended only upon a system consisting of 7 per cent of the total road mileage within the State, nevertheless restricts three-sevenths of that system to roads interstate in character, and with which must connect or correlate the remaining four-sevenths of the system consisting of secondary or intercounty roads. However, 60 per cent of the Federal aid allotted to each State must be expended upon the interstate roads in the State system, but the entire allotment of Federal money to any State may be expended upon this type of road at the discretion of the State Highway Department. The fact that in the future all Federal appropriations must be expended under the direct control of the State Highway Department, with the approval of the Secretary of Agriculture, seems to effectually eliminate the possibility of local politics entering into road problems.

Many and varied are the articles of surplus war material which have been distributed through the Bureau of Public Roads among the various States for road-building purposes. These articles were turned over by the War Department to the Department of Agriculture under the Wadsworth-Kahn bill, the sole stipulation attached to their use being that they

be devoted exclusively to the construction and maintenance of roads. The distribution, which has been in process for some time, probably will be completed about the middle of next year.

Trinitrotoluol, one of the most efficient of war-time explosives, has become, by adaptation, one of the most desirable agencies for the peace-time task of road construction, according to reports received from many States by the Bureau. The use of this powerful explosive is becoming general throughout the country wherever highways are under construction. Out of the surplus war materials distributed among the various States, approximately 20,000,000 pounds of T. N. T. has found its way to the road builders' supply house. This is more than four times as much as the total of powder of all grades distributed by the department among the States. Among other materials of this nature distributed among the States were 6,566 pounds of dynamite, 267,600 pounds picric acid, 938,409 detonators, 131,674 exploders, 75,968 electric blasting caps, 27,840 feet of fuse, 7,340 yards of detonating cord, and 198 tampers.

"All They Can Handle"

Texas Producers Are Keeping Production Up to Maximum

By Our Dallas Correspondent

Gravel and sand dealers in Dallas and ohtre cities in Texas report continued good demand for their products, with no weakening of prices. Building operations not only are holding ther own, but show an increase in practically every part of the state, and with the increasing building operations, there comes an increased demand for sand and gravel.

In Dallas it is noticeable that of the residences under construction, a greater number are of brick or concrete than ever before noted. The buildings are of more substantial construction, with better foundations, and more concrete work. All these things increase the amount of sand and gravel used, and dealers say this increase is a material factor in the market at this time.

"Build Now" campaigns are being launched in various parts of Texas by real estate men and business interests generally as a means of improving business and relieving the unemployment situation. These campaigns, wherever launched, have resulted in increased building operations and a larger demand for sand gravel.

County and city governments are also speeding up public works in order to relieve unemployment wherever possible. Street paving and highway improvements are being pushed, and every city and town in the state that has voted bond issues and has funds available for such improvements is going ahead with such work. The city of Dallas has allotted most of the $2,800,000 bond issue recently voted, and is going forward with street paving. Dallas county is also proceeding with work on various highway projects, involving the expenditure of several hundred thousand dollars. Other Texas cities and counties also have large street and road building operations under way, and the consumption of sand and gravel is just about keeping up with the supply.

The J. Fred Smith Gravel Company, West Dallas Gravel Company, Trinity Sand and Gravel Company and other large firms in Dallas report a demand equal to their supply. These firms say they can place every carload of sand or gravel they can load.

Gravel firms in and near Dallas that deliver gravel on the job by team or motor truck report all the business they can handle with their present equipment.

Pit run gravel is being sold in Dallas f.o.b. cars at $1.00 to $1.50 per cubic yard, while gravel delivered on the job ranges from $2.00 to $3.50 per cubic yard.

The Koppel Industrial Car & Equipment Company who are large manufacturers of industrial cars, narrow-gauge track, materials, etc., with a plant at Koppel, Pa., and several branches throughout the country, have opened a new district office at Kansas City, Mo., located in the Railway Exchange Building. Mr. Harry C. Kraft, formerly with the New York office, has been appointed manager of the Kansas City district.

Kentucky Ready to Act

Will Appropriate $5,000,000 for Road Building—Other Projects

By Our Louisville Correspondent

Highway building is the big center of interest right now which has direct connection with crushed stone and sand and gravel operations. There have been a number of conferences recently looking to increasing the fund for and enlarging the scope of road building undertakings in the state and the ideas and plans in this connection have been stimulated some lately by conference ideas in Washington on developing road work to help solve the unemployment problem.

Our State Highway Commissioner, Mr. Jos. S. Boggs, has informed the conference at Washington that Kentucky could appropriate five million dollars for road construction work within ninety days.

This is fairly in keeping with the spirt of the times and with the people of Kentucky toward road building. In fact there has been outlined recently plans for a fifty million dollar bond issue and on all sides we have plans for a greater roadway system being mapped out, and meantime perhaps as much active work in road building as in any of the states of equal magnitude.

Were it not for this road building things would be mighty dull among the quarry people as well as among the sand and gravel people because the commercial business in crushed stone is still waiting for lower freight rates and even the railroads lately have been cutting down on the quantity called for and used in ballast work. Some of the railroads are planning and talking about extensions and improvements but so far as actual business is concerned the present policy seems to be one of retrenchment and this is reflecting itself in the form of closed quarry operations. So at the present writing there is not much doing in the quarry business except in connection with road building contracts.

R. B. Tyler, Secretary of the Kentucky Crushed Stone Association, says that they are operating in connection with their road contracts but there is nothing doing in a commercial way in crushed stone, and even the railway ballast business has been cut down lately from some cause or other. So it is a very quiet time among the quarries in Kentucky.

As to the next meeting of the Kentucky Association, he says they plan to have a meeting soon after the first of the year but the exact date has not yet been set.

The E. T. Slider Co. report that the sand and gravel business has quieted down at this writing. It is practically the end of the busy season and they are now filling up their yards with stock against the time when they cannot operate on the river, and are making preparations to devote more of their energies to the coal end their business through the winter months. Mr. J. E. Lloyd, manager of the Louisville yard of this company, says that enlarged activities in road building to take care of the unemployed would make for improvement in the sand and gravel business.

Some pretty lively interest has been awakened here in the subject of river traffic by an announcement originating in a Waterways Conference at Evansville that Ford contemplates putting a fleet of small high speed motor boats on the Ohio River to help revive river traffic. The Louisville Courier Journal refers to it as a "Water Flivver" proposition and says if Henry can put this project through he deserves to be known as one of the really great benefactors of the country.

The Sewer Commission of the city of Louisville has plans in hand for the construction of practically two million dollars worth of sewers in Louisville, which it is thought will help out some, but it will not be a big factor in the sand and gravel business as most of it is pipe sewer work.

One of the most extensive projects coming to light lately is in plans for developing a great water power plant to serve Central Kentucky by harnessing the Dix River two miles above High Bridge, Kentucky, at a cost of four million dollars or more, which it is said will develop a power plant that will supply 30 million horse power of electric current. Plans for this scheme came to notice through the recent introduction into the United States Senate of a bill to close navigation on

Dix River by Senator A. O. Stanley. Also it brought out a statement that the Kentucky Utilities Co. is interested in the scheme and that the plans include erecting a dam 700 feet wide and 235 feet high, an undertaking which will perhaps require a year and a half or two year's work.

Bigger Than Expected

Eastern Cement Producers Had Unusual October Business

Eighteen cement manufacturers in the eastern states show than on October 31 they had 1,811,000 barrels of cement stock on hand as against 2,361,000 barrels in September. Their shipments for October 1920 and 1921 were identically the same, approximately 2,400,000 barrels, and that the shipments for the first ten months of the year were almost equal to the 24,838,000 barrels of record-breaking 1920, or 23,371,000 barrels.

The average cement shipments for six years by these same eighteen companies is 22,631,000 while that for the first ten months of 1921 is 23,371,000, a change of 3.3. The October six year average shipments is 2,894,000 barrels while that for October 1921 shows a gain over the average of 18.4 or 3,427,000 barrels.

There will be found the same general economic conditions in the current reports of many of the other basic building material manufacturers, all indicating that there had been no expectation of any such building movement at this time of the year, such as that which has developed.

Traylor Engineering Co. Receives Large Contract

The Traylor Engineering Co., Allentown, Pa., has received a large contract for machinery and equipment to be used in connection with the rebuilding of the plant of the Britannia Mining & Smelting Co., Britannia Beach, B. C., recently damaged by flood. The award covers 23 machines, comprising 18 large tube mills, 4 sets of large crushing rolls, and 1 set of crushing rolls, 72 inches in diameter. The machinery is estimated to weigh about 1,600,000, and will take about 3 months to build at the plant. Shipment is to be made at the earliest possible date. W. B. Roberts, president of the company, has recently returned from a trip to the Britannia Beach plant, after securing the contract.

Opened Own Offices

Mr. W. H. K. Bennett, who has for a number of years been connected with the American Manganese Steel Company of Chicago as manager of the pump department, has recently opened his own offices in Suite 903, at 20 East Jackson Boulevard, Chicago, and will hereafter act as sales agent for the Amsco pump and will also devote his energies to the design and construction of sand and gravel dredges and screening plants.

Mr. Bennett will also represent the American Traveling Suction Screen Nozzle Company of Eddyville, Iowa. This concern manufactures a device which serves the purpose of cutting and agitating the gravel under the nozzle and preventing the entry of stones large enough to clog the system. Mr. Bennett reports the installation of a number of these devices in plants in various parts of the country and states that in every instance they are working with high efficiency. The equipment may be fitted to any dredge now in operation without any changes in construction.

In addition to the above duties, Mr. Bennett is also selling manganese steel repairs for all makes of pumps, suction hose dredging sleeves, hose clamps, etc.

The Charles Warner Co., Wilmington, Del., manufacturer of lime products, and operating a local supply business, has filed plans for the erection of a new crushing plant at its works on South Market Street. New crusher machinery will be installed.

The Escambia Sand & Gravel Corporation, Flomaton, Ala., has perfected plans for the installation of a new dredging plant at its property. An 8-inch pumping dredge of 6-car capacity will be operated, with screening and other machinery.

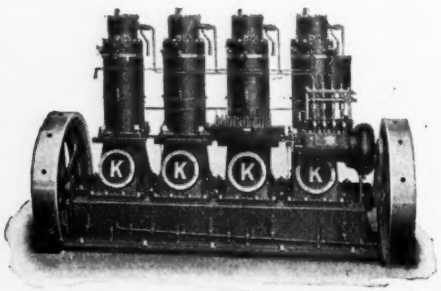
J. J. Slate, Jefferson City, Mo., is planning for extensive operations at limestone quarries in this section, recently acquired. A complete plant will be established, including lime kilns, crusher, etc.

Anderson Oil Engine

Most all plants and concerns are today interested in obtaining power at the lowest minimum cost. The high price of most fuels makes the overhead expense of operation nearly prohibitive, if a reasonable profit is expected. For this reason the Fuel Oil engines are becoming more in demand, and are being sold quite extensively throughout the United States and foreign countries.

The cost of coal sets the price of fuel oil, for this reason fuel oil cannot materially advance in price. Fuel oil is a by product—the residue after the refiner has extracted manufactured products (gasoline, kerosene, distillate —or distillate oil, lubricating oil, etc.).

Petroleum statistics will show that over half of the crude oil produced is



put onto the market in the form of "fuel oil" to be used instead of coal, its price is regulated by the cost of the coal it can replace, and not by the market value of crude oil, as is the case with the above refined products. The more crude refined the greater will be the supply of fuel oil or residue to be marketed in competition with its only competitor—coal. Hence it cannot advance until the price of coal does. To otherwise advance would result in no market, the natural consequene of which would force the price back to that of the coal it could replace. Distillate oil may advance materially, but fuel oil cannot.

The Anderson oil engine was first marketer in 1907, and since then the increased cost of coal and shortage of gas has made the demand for oil engine power far beyond the expectations of the men who were developing the oil engine industry at that time.

The Anderson oil engine is made in a factory that specializes on oil engine construction, making all parts of the engine with the exception of crank shaft, mechanical oiler and water circulating pumps. Every part used is thoroughly tested and all parts are interchangeable.

The new types are now as automatic and fool proof as an engine can be made, and are simple and easily understood by the average user. They will operate steadily without a massive foundation: they will work well in hot or cold climates: they will run with or without water in the mixture and they will burn any fuel that any other engine has ever operated on successfully.

The Anderson Foundry & Machine Company, Anderson, Ind., appreciate the fact that any power plant is as dependable as its poorest part and therefore, have equipped their engines with only the highest grade acccessories.

The new catalogues on Anderson oil engines is now ready for distribution, any one interested can get a copy by addressing the company.

The Bucyrus Company announces the removal of its New York Office to Suite 728, 30 Church Street, with Mr. E. G. Lewis in charge as eastern sales manager, effective December 1st. Mr. Lewis has for many years been connected with the sales organization of the Bucyrus Company, both in Chicago and in New York, and has also had wide experience in railroad and general contracting work, both in this country and abroad. Mr. M. J. Woodhull, who has had large experience in the manufacture and sale of railroad construction equipment with the Bucyrus Company and elsewhere, is appointed central sales manager to succeed Mr. Lewis in charge of the Chicago Office, 622 McCormick Building.

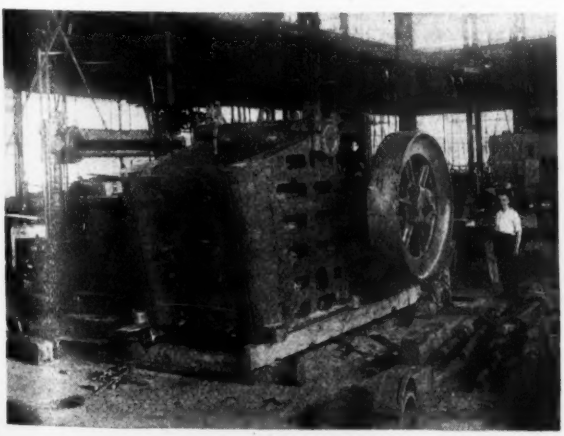
The Hudson Valley Portland Cement Co., has been organized at Manhattan, New York, with 125,000 shares of common stock, no par value. Active capital, $1,000,000. The organizers are H. W. Davey, M. S. Reeve, E. F. Mack, Jr., attorney H. Dominitz, 152 W. 42nd St.

Best Bros. Keene's Cement Co., Medicine Lodge, Kas., has made plant alterations and enlargements.

A New Type Jaw-Crusher Frame

Recognizing the basic error of existing designs of this kind, the engineers of the Kennedy-Van Soun Mfg. & Eng. Corporation of New York, set about the development of a new type of crusher frames, that would get away from corner weakness and make a particularly strong point out of what has always been a particularly weak one. The result is the Kennedy hinge-joint frame. In this machine the extremities of the side and end frames are made circular in section, the end frames fitting into the side frames, the whole joined by a heavy steel pin. In this design the crushing strains are balanced through the side frames, taking advantage of all the strength of the metal. Being made of box section steel castings they will resist any strain placed upon them in normal crushing operations. There are no corners or edges, and any slight flexure of the end frames under heavy crushing has no effect whatever on the side frames, since the pin allows enough freedom to relieve any such movement without transmitting it to the side frames.

Rigidity of the essential parts of the frame, to maintain shaft alignment throughout, is insured by three precautions. First, the front end frame is inclined and the rear end frame is vertical. Second, heavy through bolts with spacers join the side frames between the swing jaw and pitman. Third, the read end frame is made with a heavy rib projecting inwardly and securely bolted at its extremities to the side frames. There is no possibility of the machine getting out of alignment. The inclination of the front end frame, about the same as the swing jaw, also ensures half of the weight of the stone being carried on the frame, increasing the sliding moment with less power. This equalizing of the slope also has the advantage of allowing the machine to handle effectively a larger piece than would be possible in crushers of the same size that have one of the two jaws vertical.



Raymond Brothers Impact Pulverizer Company, of Chicago, have located a permanent eastern office at 50 Church Street, Hudson Terminal Building, New York City. Mr. S. B. Kanowitz will be in charge, and will be pleased to give engineering information on any grinding proposition which may be put up to him.

Mr. H. A. Kimber, formerly of the Quigley Furnace Specialties Co., is now in charge of the sales of the Quigley Pulverized Fuel Department of the Hardinge Company, 120 Broadway, New York, N. Y. This change was made owing to the acquirement by the Hardinge Company of the Pulverized Fuel Department of the Quigley Furnace Specialties Co. Mr. L. W. Marso, who is in charge of the Branch Office of the Quigley Furnace Specialties Co., located at 427 Oliver Building, Pittsburgh, Pa., has now become associated with the Hardinge Company, 120 Broadway, New York, N. Y., and will continue in the Pittsburgh Office under the name of the Hardinge Company, but will specialize in the handling of the Quigley pulverized fuel systems. Mr. O. M. Rau, formerly consulting engineer to the Philadelphia Rapid Transit Co., has now become associated with the Hardinge Company, and will also specialize in the handling of Quigley pulverized fuel system as applied to boilers.

Electricity in Pits and Quarries

By DANIEL J. HAUER

This is the third of a series of articles discussing the many features of using electricity in pit and quarry operations. The former articles have appeared in the October and December, 1920, issues of PIT AND QUARRY.

THE present article will discuss the feature of using electricty for transportation in quarries. For more than a decade electrical locomotives have been used in mines and quarries. Inasmuch as the greater use of this equipment has been that for mine transportation, the development of the locomotive has been along the line of the mining industry.

This has brought forth a low type of locomotive so as to admit of the machine entering the mine tunnels, and also with small diameter wheels to go around the sharp curves in the tracks. It is possible to use this same type of locomotive in pits and quarries, especially as sharp curves are also used in the tracks in these industries. It is of interest to note that if the locomotive had been developed along the line of quarry use, it would have likely been built of much higher type. A type of this character has been developed for industrial plants and has been used extensively in steel plants for handling kettles of molten metal and newly cast hot ingots.

The electrical locomotives are of two types as to the application of power. The first is that of furnishing electrical power by means of a trolley wire from a central power plant. In the second type the power is supplied by means of storage batteries.

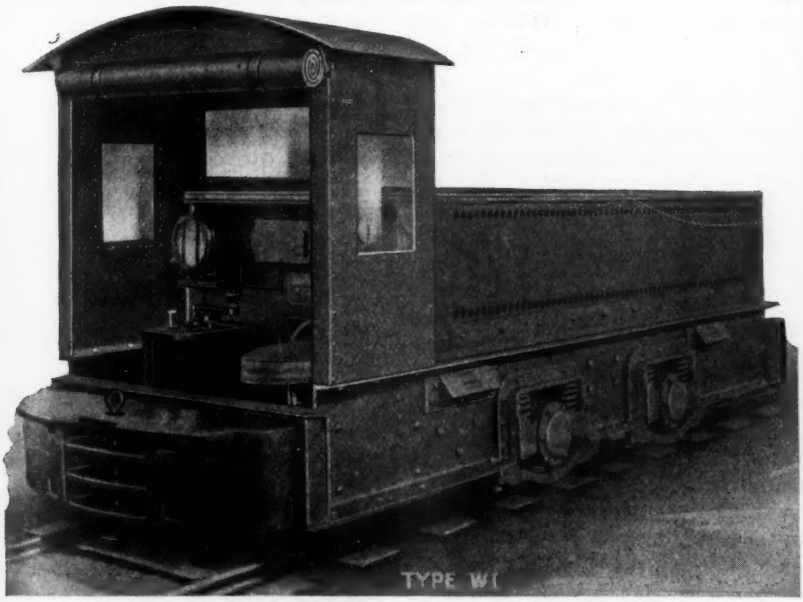
Where blasting is done and the entire operation is in a limited area, the use of a trolley wire is precluded, for at every heavy blast the power line would be broken, not only tying up the work, but running a grave chance of accident. Such locomotives could be used in sand and gravel production where blasting need not be done. The high type of locomotive should be used in such operation for one of the objections to the low type with a trolley arm is that the trolley wire is so low, that men are likely to get in contact with it, causing serious accidents, probably deaths.

It is possible to have a combination of trolley and storage battery locomotive, using a trolley arm on the main tracks away from the heart of the quarry, leading to the plant, and the storage batteries near the heart of the quarry, where the blasting must be done. But this would only be in exceptional cases.

For the reasons set forth, only the storage battery locomotives can be recommended for general use in pits and quarries. The writer does not advocate their use for irregular hauling over long distances, for it is doubtful if this method of transportation can compete for economy with either steam or gasoline, but for transporting loads over a limited area as in pits and quarries, and with power available to recharge the batteries, the storage battery locomotive has proven to be both efficient and economical.

They are quick acting, built along rugged lines and have ample weight with the motors and batteries to give excellent traction power on the rails. The machinery and batteries are all housed so as to protect them from the weather.

The locomotives can haul up steep grades at a fair rate of speed. Like any other locomotive they are more economical on easy gradients. They



Your Plans for Electrical Equipment Should Include Ironton Locomotives

The Ironton Storage Battery Locomotive is in successful operation in quarry work; mining of limestone rock for cement; brick plant haulage; salt mining, etc. It was the pioneer battery locomotive for gathering and hauling coal, and in this service alone there are nearly 1,000 "Irontons" in use. In each kind of service "Irontons" have proven efficient and economical.

The "Ironton" is particularly well adapted for use in pits and quarries because it is easy to operate and does not require an expert mechanic or a licensed engineer. The battery is recharged during idle hours or at night, through an automatic switchboard. Any standard locomotive battery may be used.

The "Ironton" operates over almost any kind of track and does not require bonded rails or overhead trolley. It has a short wheel base, permitting it to operate on curves of short radius. Heavy channel steel frame and sheet steel battery compartment affords a rugged construction which protects all working parts and battery. It is fitted throughout with heavy duty ball bearings. There are no exposed moving parts, each axle being driven by a worm and gear, similar to that used in heavy auto truck service. These are fully inclosed and operate in oil.

Ironton locomotives have stood the test of years of continuous service. They are built to withstand the rough treatment to which equipment of this kind is subjected.

For full particulars communicate with

THE IRONTON ENGINE COMPANY

Main office and factory, Ironton, Ohio

Manufacturers

Pittsburgh
Philadelphia
Chicago
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THE IRONTON
STORAGE BATTERY LOCOMOTIVE

Huntington, W. Va.
Louisville, Ky.
Birmingham, Ala.
Seattle.

have stood up to the rough usage in mines and quarries. However they do much better work when they are given intelligent care.

From this experience gained so far in their operation the increased efficiency has been marked, and there have been fewer repairs to make, when there has been the proper maintenance, and the life of the batteries has been made much longer when properly recharged at regular intervals. Care must be exercised that leakage does not occur from the batteries, and connections are not broken or injured.

Short circuits can occur in the batteries due to the metal battery tops coming in contact with the cell terminals, causing explosions that can blow off the cell tops. The batteries can also be injured and their efficiency lowered by allowing dirt to accumulate in and around the cells.

These locomotives can be purchased from a number of different manufacturers, and it is possible in many cases to specify the make of batteries to be placed in them. These batteries are sold on a guarantee usage of a certain number of years. This period is generally from five to ten years. Although the batteries last in some cases the full period of the guarantee, yet in other cases they do not and the companies selling them make adjustment in the difference in life and the time of guarantee.

Ample provision should be made in the pit or quarry shop to recharge the batteries, and there should be a record kept of the date and the value and amount of charge, so as to have exact data as to the performance of the batteries. For this reason there should be installed measuring instruments, so as to eliminate all guess work, this means all cells will be charged alike and prevents both under and overcharging.

Resistors must likewise be looked after in the proper manner and should always be protected. Because the locomotive presents the appearance of a heavy wire flat box on wheels it must not be thought that men can be allowed to ride on it indescriminately and heavy articles can be placed on it to be carried to the shop such as drills, etc., for this grinds the top protecting plates down upon the resistors, burning them through by forming arcs.

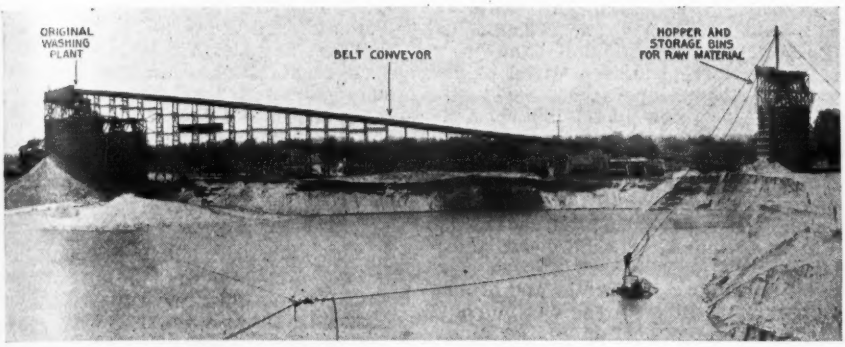
Pump Department Manager

Announcement is made by the American Manganese Steel Company, Chicago Heights, Ill., of the appointment of Mr. Bradley S. Carr as manager of the pump department.

Bradley S. Carr

Mr. Carr is very well equipped to advise in matters pertaining to centrifugal pumps by his training and many years of practical experience.

Don't Move Your Plant— Extend it's Area of Operation



MANY sand and gravel plants using cableway excavators move their washing screens and bins after a few years of operation, because the material within reach of the cableway has been taken out.

In most cases this expense and bother are unnecessary. The plant can continue to operate on its original location by the addition of a smaller bin in a new location and a connecting belt conveyor.

In fact, a greatly increased capacity can be obtained. The new bin not only gives an extra temporary storage of raw material, but adds to the flexibility of the plant. For instance, the night hoist operator can fill the storage bin, and the day crew can start washing immediately in the morning, and handle the material from both night and day digging, during the day.

Link-Belt engineers are ready to aid in the solution of your sand and gravel handling problems. Send for book No. 440.

LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS

OFFICES IN PRINCIPAL CITIES

831

LINK-BELT

Gasoline Electric Shovel

A new general catalogue on Excavating Machinery has recently been issued by the Marion Steam Shovel Company, Marion, Ohio. This is known as catalogue No. 190, and is sufficiently up-to-date to include the new Marion revolving shovel, Model 21, for gasoline-electric operation.

On the gasoline-electric shovel a direct connected generating set is installed at the rear of the upper frame, located in approximately the same place as the boiler on the steam machine. This generating set consists of a four cylinder, vertical, heavy duty gasoline engine fitted with Bosch magneto, Stromberg carburetor and bronze water pump and with the engine shaft extended for connection to the direct current generator. The engine has an S. A. E. rating of 53 H. P. On the all-electric machine this gasoline engine is replaced with an electric motor, otherwise the construction of the machines are identical. With either type the generating set is mounted on a heavy cast iron base.

The "juice" is generated in the special 25 K. W. direct current generator. From this generator feed lines lead to the controllers which are located at the front of the shovel and which have movements identical with the levers on the steam machines. Three controllers are used, one each for the hoisting, rotating and crowding, and from each of these controllers lines lead to their respective motors.

These new machines are just as flexible as steam and they will handle just as hard material at the same speed as any steam machines we have ever produced. Because of the special construction of the generator a peculiar voltage characteristic is generated, thereby assisting in obtaining extreme flexibility.

The Pulverburner

The Pulverburner is a new machine for the preparation of powdered coal which has recently been placed on the market by the K-B Pulverizer Co., Inc., New York.

The essential features of the machine are the pulverizing mechanism and the air separating chamber.

It will be seen from the cut (Fig. 1) that the machine is fed by an automatic feeder of the belt type.

The pulverizing is accomplished by means of six rapidly revolving hinged beaters which smash the coal against breaking blocks and then against grinding plates in the bottom of the machine. The pulverulent material is discharged by centrifugal force directly into a large separating chamber. An exhaust fan, in the discharge duct leading from the separating chamber, induces air at slow velocity through the chamber, removing the fine coal and allowing the oversize to return to the machine for further pulverization. It is apparent that the velocity of the air through the separating chamber determines the fineness of the product. From the separating chamber, the fine dust is drawn through the fan and blown directly into the furnace. Secondary air is added at the nozzle. By using "splitters" the stream of coal and air can be distributed to several nozzles, thus enabling one machine to serve several furnaces.

The "Pulverburner" Fig. 1. Exterior View